

HEFS Test Manual

Version: HEFS 1.2.1

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National Weather Service

Office of Hydrologic Development

Revision History

Date	Version	Description	Author
09/16/2013	1.0	Initial Draft	Shaif Hussain
09/17/2013	1.1	Final Version	Shaif Hussain
12/02/2013	1.2	Updated for HEFS 1.0.2	Shaif Hussain
04/17/2014	1.3	Updated for HEFS 1.1.1	Shaif Hussain
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Contents

Revision History	2
1. Test Objective	4
1.1. Directories of Note.....	4
1.2. Test Summary:	4
2. Testing Functionalities.....	5
2.1. MEFP Data Ingest (Optional).....	5
2.2. MEFP PE (Optional)	12
2.3. EnsPost PE (Optional).....	20
2.4. MEFP Forecast.....	25
2.5. EnsPost.....	32
2.6. GraphGen.....	33
3 Testing Fixes.....	35
3.1 List of FogBugz tests.....	35
3.2 FogBugz 1427 – MEFPPE using historical forecast date	35
4 Testing Enhancements	37
4.1 List of enhancement tests.....	37
4.2 FogBugz 1059 – Display probabilistic inflow volume accumulation plot.....	37
4.3 FogBugz 1442 – HEFS Aptima product.....	38
4.4 FogBugz 1493 – GraphGen aggregator enhancements	39
4.5 FogBugz 1496 – GraphGen axis display	40

1. Test Objective

Testers will test on a Standalone that is already configured with HEFS. Testers will verify whether the HEFS components are working as intended. The components to be tested are Data Ingest, MEFP & EnsPost Parameter Estimation (PE), MEFP forecast, EnsPost, and GraphGen.

A prerequisite of this test is installing and configuring CHPS 4.0.1 and HEFS 1.1.1 (see associated install notes), updating or re-estimating the MEFP parameters, and converting or re-estimating the EnsPost parameters.

This test manual has three testing sections to be tested by different sets of HEFS RFCs. Section 2 is a test of existing functionalities for all RFCs to test. Sections 2.1, 2.2 and 2.3 are optional as re-estimation of parameters is not required for this release. Section 3 is a test of all the fixes which should be tested by the reporting RFCs; see the table at the beginning of the section for which RFCs are responsible for which tests and if a test procedure is provided. Section 4 is a test of the enhancements in this release, see the table at the beginning of the section for which RFCs are responsible for which tests and if a test procedure is provided. Some fixes and enhancements are tested as part of running the HEFS workflows and don't need any additional steps to test and therefore does not have any test procedures.

1.1. Directories of Note

The following directories will be referred to in the instructions provided below:

- *<region_dir>*: The *installation stand-alone* region home directory, typically “*##rfc_sa*”.
- *<configuration_dir>*: The stand-alone Config directory, typically *<region_dir>/Config*.
- *<tar_root_dir>*: The directory where the release package was untarred.
- *<mefp_root_dir>*: The directory selected to hold CFSv2 location time series files and MEFP parameter files; see the *MEFP Configuration Guide: Data Ingest Components*.

1.2. Test Summary:

For Section 2 each test consists of two sections: Test Prerequisites and a Test Procedure.

- **MEFP Data Ingest**
Data ingest workflows prepare gridded forecast inputs to MEFP. This test will run the workflow for the data ingest components and verify the result using the FEWS GUI.
- **MEFP PE**

The MEFP Parameter Estimator (MEFPPE) is a FEWS explorer plug-in designed to guide the user through the process of estimating parameters for use with MEFP. This test will run the MEFPPE workflow using the FEWS GUI to estimate parameters and verify the results.

- **EnsPost PE**

The EnsPost Parameter Estimator (EnsPostPE) is a FEWS explorer plug-in designed to guide the user through the process of estimating parameters for use with EnsPost. This test will run the EnsPostPE workflow using the FEWS GUI to estimate parameters and verify the results.

- **MEFP Forecast**

The MEFP forecast workflow generates the forecast ensembles. This test will execute the workflow using the FEWS GUI to generate the forecast ensembles and verify the results.

- **EnsPost**

The execution of the EnsPost workflow post processes stream flow ensembles. This test will run the workflow using the FEWS GUI to verify the installation was successful.

- **GraphGen**

Delivered with the HEFS release of the MEFP and HEFS, EnsPost software is pre-configured Graphics Generator products designed to display MEFP Results for HEFS EnsPost Input and HEFS EnsPost Output. Using the FEWS GUI, this test will verify the installation was successful.

2. Testing Functionalities

2.1. MEFP Data Ingest (Optional)

2.1.1 Test Prerequisites

CHPS is configured with the data ingest components as described in the document *MEFP Configuration Guide: Data Ingest Components*. Below is the same information from the confirmation section of the configuration guide.

This test is designed to replicate exactly how the grid files will be imported when configured to run as an automated workflow. The data represents that which is available for an MEFP run on Jan 31, 2013 at 12Z. The grids are imported by system times (T0) as follows:

- GFS: 1/31/13 00Z

- GEFS: 1/31/13 00Z
- CFSv2: 1/31/13 12Z (the data is 24-hours old: 1/30/13 12Z)


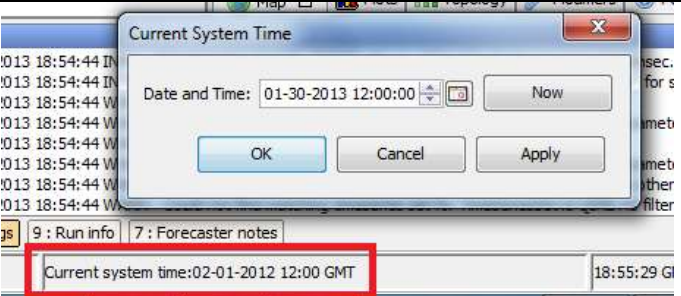
The test steps below describe how to view the gridded forecasts through the **Spatial Display Panel** of the CHPS interface.

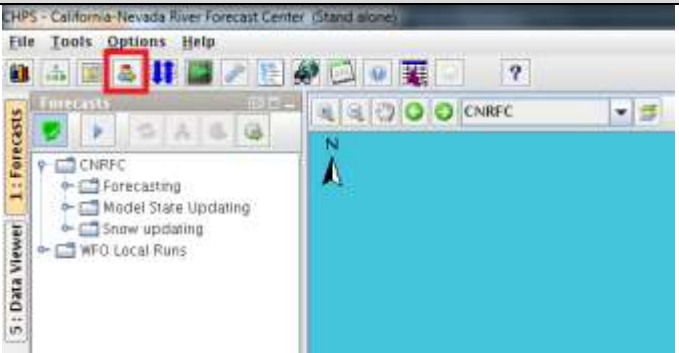
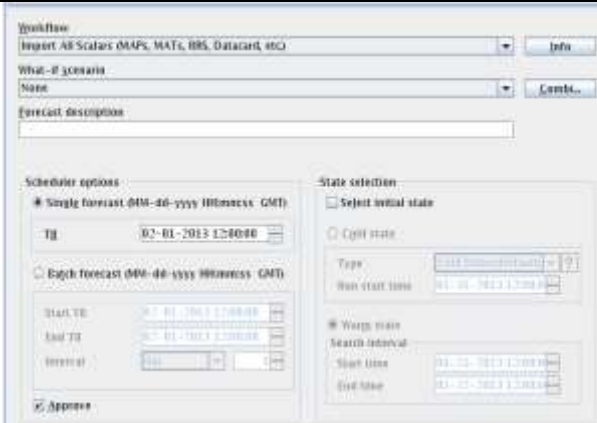

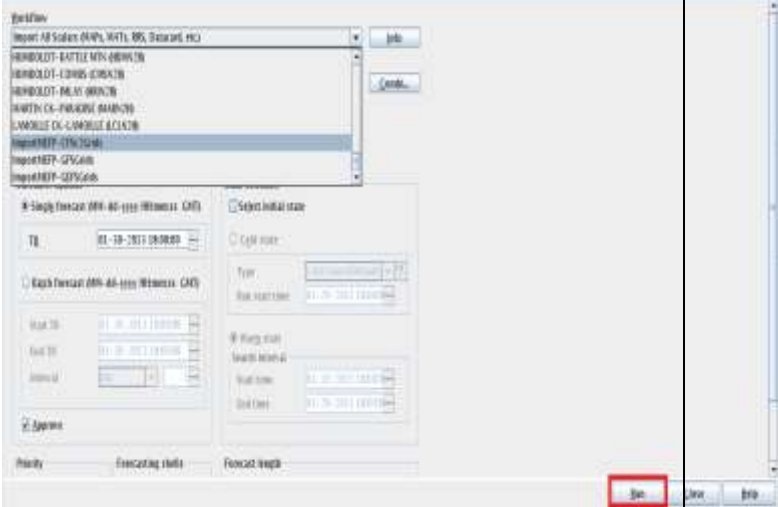
Prior to running the test, prepare the data for import as follows:

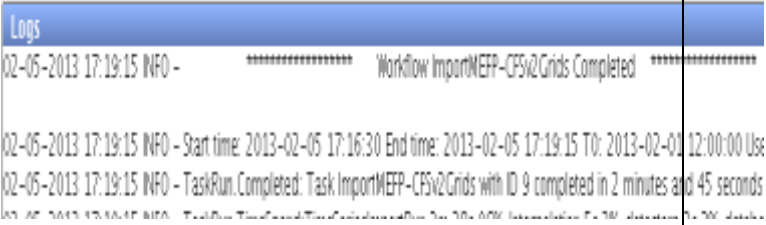
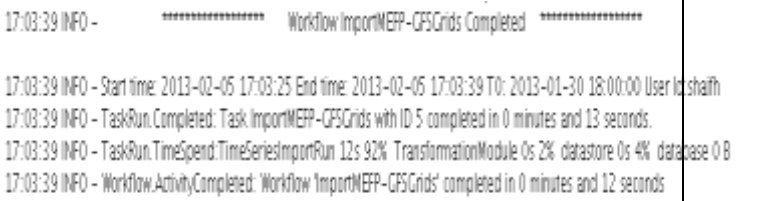
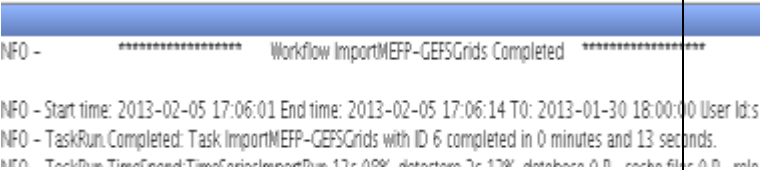
Action: Populate the `<tar_root_dir>/dataIngest/Import` directory with grid data for testing. Do the following:

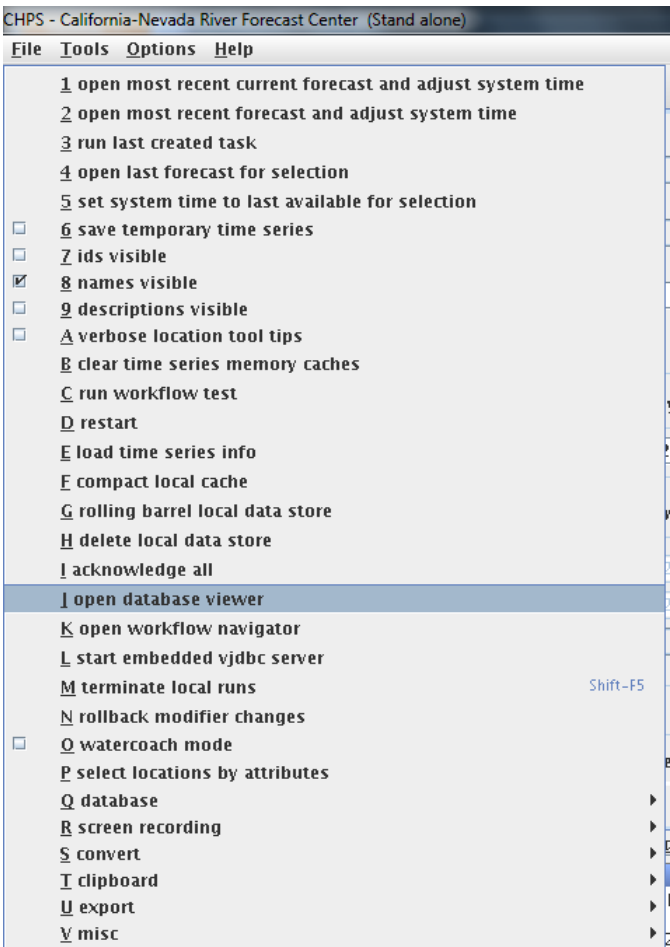
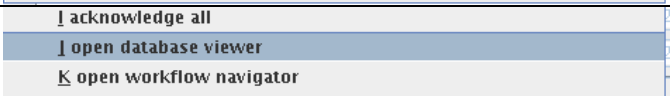

```
cd <region_dir>
tar -zxvf <tar_root_dir>/dataIngest/importTestData.tgz
```


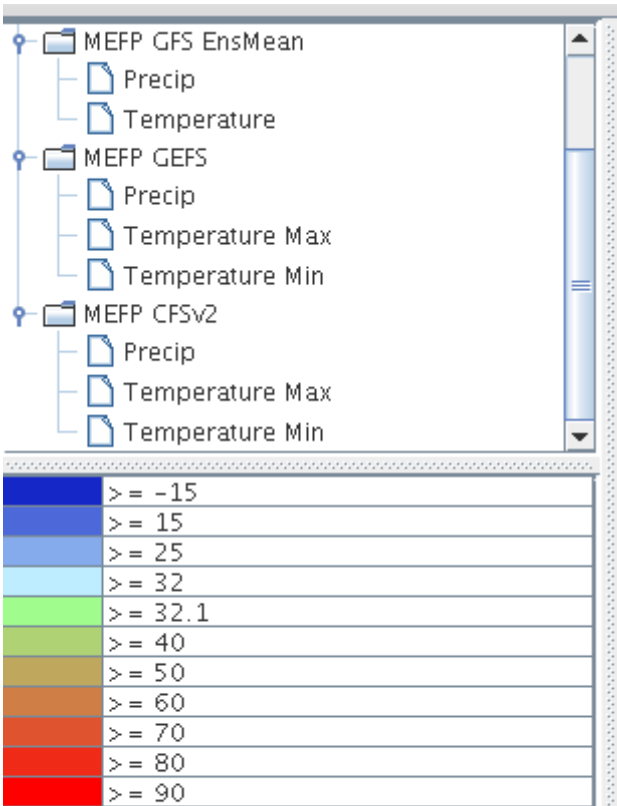
2.1.2 Test Procedure

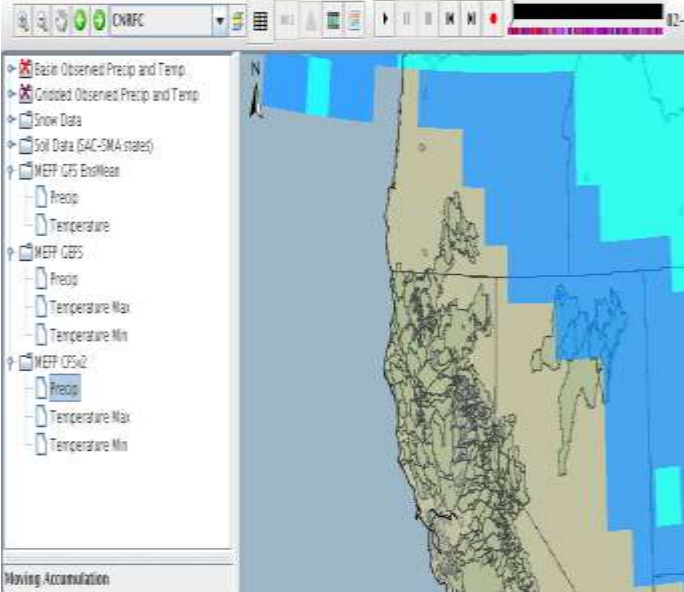

#	Action	Expected Results
1	Start FEWS using the installation standalone: <pre>cd <region_dir> cd .. ./hefsPlugins/fews_hefsPlugins.sh ##rfc_sa &</pre>	FEWS will be started. The splash screen displayed will vary by RFC. The default splash screen is:  After a short time, the CHPS interface will open.
2	Click on the Current System Time Label at the bottom of the CHPS interface so that the Current System Time dialog opens. Set the system time to 01-30-2013 12:00:00.	

#	Action	Expected Results
3	Click on Manual Forecast Button .	
4	The Manual Forecast Panel will open allowing you to select the workflow to run.	
5	In the Workflow List , select the ImportMEFP-CFSv2Grids workflow.	
6	Click Run .	

#	Action	Expected Results
7	Wait for run to complete (up to 5 minutes)	<p>We can see this in the Logs once run is complete:</p>  <pre> 02-05-2013 17:19:15 INFO - ***** Workflow ImportMEFP-CFSv2Grids Completed ***** 02-05-2013 17:19:15 INFO - Start time: 2013-02-05 17:16:30 End time: 2013-02-05 17:19:15 TO: 2013-02-01 12:00:00 User Id: shaifh 02-05-2013 17:19:15 INFO - TaskRun.Completed: Task ImportMEFP-CFSv2Grids with ID 9 completed in 2 minutes and 45 seconds 02-05-2013 17:19:15 INFO - TaskRun.TimeSpent:TimeSeriesImportRun 12s 92% TransformationModule 0s 2% datastore 0s 4% database 0 B 02-05-2013 17:19:15 INFO - Workflow.ActivityCompleted: 'Workflow ImportMEFP-CFSv2Grids' completed in 2 minutes and 45 seconds </pre>
8	Verify that appropriate directories and files for each <i>installation catchment</i> were created under the directory <code><mefp_root_dir>/cfsv2Interpolated/archive</code> .	If they were not created, then the module that exports the location-specific CFSv2 forecast time series file, or one of the preceding modules, failed to execute.
8	Perform Step 2, again, but set the system time to be 01-31-2013 00:00:00.	
9	In the Workflow List , select the ImportMEFP-GEFSGrids workflow.	
10	Click Run .	
11	Wait for run to complete (< 1 minute).	<p>We can see this in Logs once run is complete:</p>  <pre> 17:03:39 INFO - ***** Workflow ImportMEFP-GEFSGrids Completed ***** 17:03:39 INFO - Start time: 2013-02-05 17:03:25 End time: 2013-02-05 17:03:39 TO: 2013-01-30 18:00:00 User Id: shaifh 17:03:39 INFO - TaskRun.Completed: Task ImportMEFP-GEFSGrids with ID 5 completed in 0 minutes and 13 seconds. 17:03:39 INFO - TaskRun.TimeSpent:TimeSeriesImportRun 12s 92% TransformationModule 0s 2% datastore 0s 4% database 0 B 17:03:39 INFO - Workflow.ActivityCompleted: 'Workflow ImportMEFP-GEFSGrids' completed in 0 minutes and 12 seconds </pre>
12	In the Workflow List , select the ImportMEFP-GEFSGrids workflow.	
13	Click Run .	
14	Wait for run to complete (< 1 minute)	<p>We can see this in Logs once run is complete:</p>  <pre> INFO - ***** Workflow ImportMEFP-GEFSGrids Completed ***** INFO - Start time: 2013-02-05 17:06:01 End time: 2013-02-05 17:06:14 TO: 2013-01-30 18:00:00 User Id: shaifh INFO - TaskRun.Completed: Task ImportMEFP-GEFSGrids with ID 6 completed in 0 minutes and 13 seconds. INFO - TaskRun.TimeSpent:TimeSeriesImportRun 12s 92% TransformationModule 0s 2% datastore 0s 4% database 0 B INFO - Workflow.ActivityCompleted: 'Workflow ImportMEFP-GEFSGrids' completed in 0 minutes and 12 seconds </pre>

#	Action	Expected Results																																
15	Click on the Logs Panel (to make it active) and press the F12 key.	<p>A menu will appear:</p> 																																
16	Select “ open database viewer ” (shortcut key: J).																																	
17	In the Database Viewer Panel that opens, select each workflow to verify there is data in the database.																																	
18	You should be able to see the EnsMean has been calculated for the GFS Workflow.	<table><tr><td>MEFP_GFS_Interpolate_USA</td><td>Temperat...</td><td>FMAT</td></tr><tr><td>MEFP_GFS_Interpolate_USA</td><td>Precip</td><td>FMAP</td></tr><tr><td>MEFP_GFS_Grid_EnsMean</td><td>Precip</td><td>FMAP</td></tr><tr><td>MEFP_GFS_Grid_EnsMean</td><td>Temperat...</td><td>FMAT</td></tr></table>	MEFP_GFS_Interpolate_USA	Temperat...	FMAT	MEFP_GFS_Interpolate_USA	Precip	FMAP	MEFP_GFS_Grid_EnsMean	Precip	FMAP	MEFP_GFS_Grid_EnsMean	Temperat...	FMAT																				
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MEFP_GFS_Grid_EnsMean	Temperat...	FMAT																																
19	This is what you should see in the GEFS workflow.	<table><tr><th>moduleInstance</th><th>group</th><th>parameterId</th><th>locationId</th></tr><tr><td>2</td><td>2</td><td>3</td><td>2</td></tr><tr><td>ImportMEFP_GIFS</td><td>Precip</td><td>FMAP</td><td>HEFS_GIFS</td></tr><tr><td>ImportMEFP_GIFS</td><td>Temperat...</td><td>TFMN</td><td>HEFS_GIFS</td></tr><tr><td>ImportMEFP_GIFS</td><td>Temperat...</td><td>TFMX</td><td>HEFS_GIFS</td></tr><tr><td>MEFP_GIFS_Interpolate_USA</td><td>Precip</td><td>FMAP</td><td>HEFS_GIFS_USA</td></tr><tr><td>MEFP_GIFS_Interpolate_USA</td><td>Temperat...</td><td>TFMX</td><td>HEFS_GIFS_USA</td></tr><tr><td>MEFP_GIFS_Interpolate_USA</td><td>Temperat...</td><td>TFMN</td><td>HEFS_GIFS_USA</td></tr></table>	moduleInstance	group	parameterId	locationId	2	2	3	2	ImportMEFP_GIFS	Precip	FMAP	HEFS_GIFS	ImportMEFP_GIFS	Temperat...	TFMN	HEFS_GIFS	ImportMEFP_GIFS	Temperat...	TFMX	HEFS_GIFS	MEFP_GIFS_Interpolate_USA	Precip	FMAP	HEFS_GIFS_USA	MEFP_GIFS_Interpolate_USA	Temperat...	TFMX	HEFS_GIFS_USA	MEFP_GIFS_Interpolate_USA	Temperat...	TFMN	HEFS_GIFS_USA
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MEFP_GIFS_Interpolate_USA	Temperat...	TFMN	HEFS_GIFS_USA																															

#	Action	Expected Results																																																				
20	This is what you should see in the CFSv2 workflow.	<table><thead><tr><th>moduleInstance</th><th>group</th><th>parameterId</th><th>qualifiers</th></tr></thead><tbody><tr><td>4</td><td>2</td><td>3</td><td>1</td></tr><tr><td>MEFP_CFSv2_Interpolate_USA</td><td>Precip</td><td>FMAP</td><td></td></tr><tr><td>MEFP_CFSv2_Interpolate_USA</td><td>Temperat...</td><td>TFMX</td><td></td></tr><tr><td>MEFP_CFSv2_Interpolate_USA</td><td>Temperat...</td><td>TFMN</td><td></td></tr><tr><td>MEFP_CFSv2_Interpolate_Location_FMAP</td><td>Precip</td><td>FMAP</td><td>CFSv2</td></tr><tr><td>MEFP_CFSv2_Interpolate_Location_FMAP</td><td>Precip</td><td>FMAP</td><td>CFSv2</td></tr><tr><td>MEFP_CFSv2_Interpolate_Location_FMAP</td><td>Precip</td><td>FMAP</td><td>CFSv2</td></tr><tr><td>MEFP_CFSv2_Interpolate_Location_TFMX</td><td>Temperat...</td><td>TFMX</td><td>CFSv2</td></tr><tr><td>MEFP_CFSv2_Interpolate_Location_TFMX</td><td>Temperat...</td><td>TFMX</td><td>CFSv2</td></tr><tr><td>MEFP_CFSv2_Interpolate_Location_TFMX</td><td>Temperat...</td><td>TFMX</td><td>CFSv2</td></tr><tr><td>MEFP_CFSv2_Interpolate_Location_TFMN</td><td>Temperat...</td><td>TFMN</td><td>CFSv2</td></tr><tr><td>MEFP_CFSv2_Interpolate_Location_TFMN</td><td>Temperat...</td><td>TFMN</td><td>CFSv2</td></tr></tbody></table>	moduleInstance	group	parameterId	qualifiers	4	2	3	1	MEFP_CFSv2_Interpolate_USA	Precip	FMAP		MEFP_CFSv2_Interpolate_USA	Temperat...	TFMX		MEFP_CFSv2_Interpolate_USA	Temperat...	TFMN		MEFP_CFSv2_Interpolate_Location_FMAP	Precip	FMAP	CFSv2	MEFP_CFSv2_Interpolate_Location_FMAP	Precip	FMAP	CFSv2	MEFP_CFSv2_Interpolate_Location_FMAP	Precip	FMAP	CFSv2	MEFP_CFSv2_Interpolate_Location_TFMX	Temperat...	TFMX	CFSv2	MEFP_CFSv2_Interpolate_Location_TFMX	Temperat...	TFMX	CFSv2	MEFP_CFSv2_Interpolate_Location_TFMX	Temperat...	TFMX	CFSv2	MEFP_CFSv2_Interpolate_Location_TFMN	Temperat...	TFMN	CFSv2	MEFP_CFSv2_Interpolate_Location_TFMN	Temperat...	TFMN	CFSv2
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MEFP_CFSv2_Interpolate_Location_TFMN	Temperat...	TFMN	CFSv2																																																			
21	Click Spatial Button in the toolbar of the CHPS interface.																																																					
22	When the Spatial Display Panel opens, on the left, expand all three of the following: “MEFP GFS EnsMean”, “MEFP GEFS”, and “MEFP CFSv2”.	<p>There should not be any red X's on any of the expanded nodes (a red X indicates missing data) and the tree should appear similar to the screen shot below:</p> 																																																				


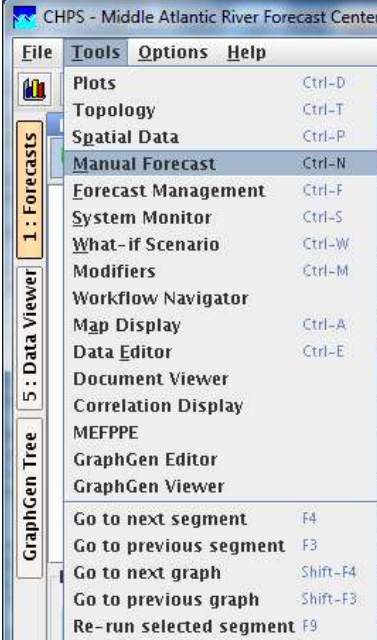
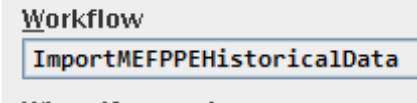
#	Action	Expected Results
23	Select each of the “Precip”, “Temperature”, and “Temperature Max/Min” nodes made visible in the last step and confirm that gridded data is displayed on the map to the right.	
24	From the File Menu , select “Exit” to close the standalone.	

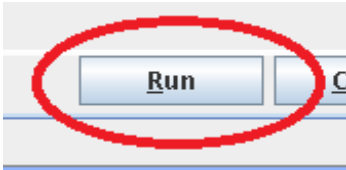
2.2 MEFP PE (Optional)

2.2.1 Test Prerequisites

CHPS is configured with the MEFPE components as described in the document *MEFPPE Configuration Guide*. Below is the same information from the confirmation section of the configuration guide. The directory `<configuration_dir>/Import/mefppe_cardfiles` should already be populated with MAP and MAT datacard files.

2.2.2 Test Procedure

#	Action	Expected Results
1	Start FEWS using the installation standalone: <code>cd <region_dir></code> <code>cd ..</code> <code>./hefsPlugins/fews_hefsPlugins.sh ##rfc_sa</code> <code>&</code>	FEWS will be started. The splash screen displayed will vary by RFC. The default splash screen is:  After a short time, the CHPS interface will open.
2	In CHPS, run the “ImportMEFPPEHistoricalData” workflow. Choose Tools (menu), Manual Forecast (menu option).	
3	Under Workflow (pull down menu), choose ImportMEFPPEHistoricalData . It may be the last Workflow.	

#	Action	Expected Results
4	Click Run (button). 	Output (in the CHPS log area) will have “Workflow ImportMEFPPEHistoricalData Completed”, as shown in Figure 1 below. The historical MAP/MAT datacards have been imported.

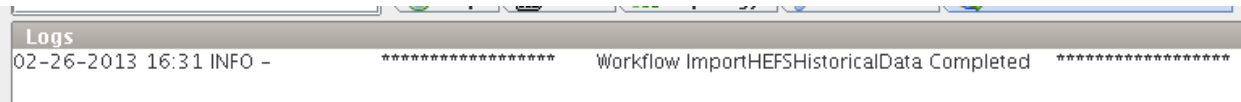
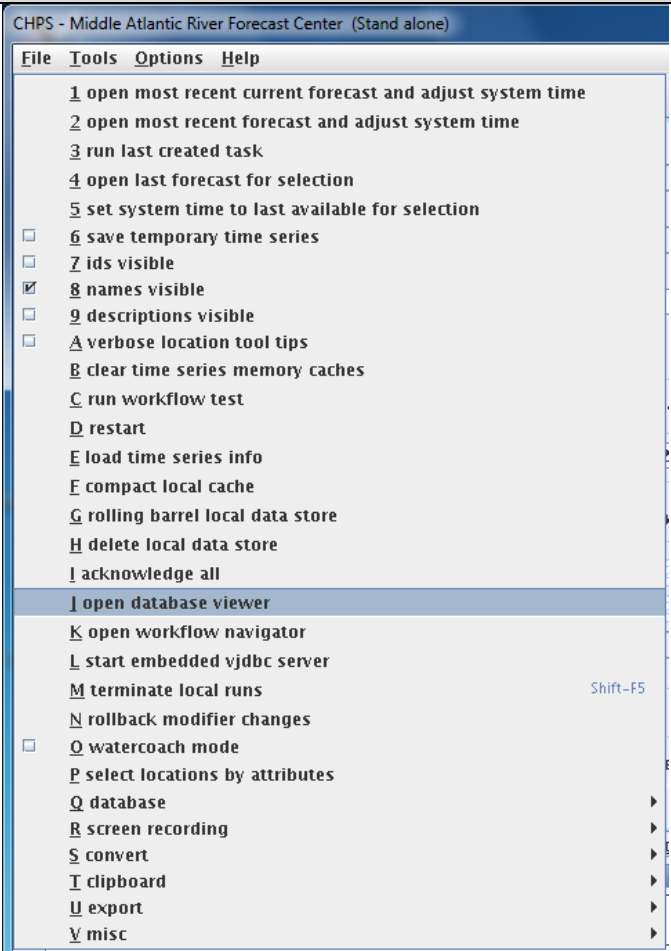


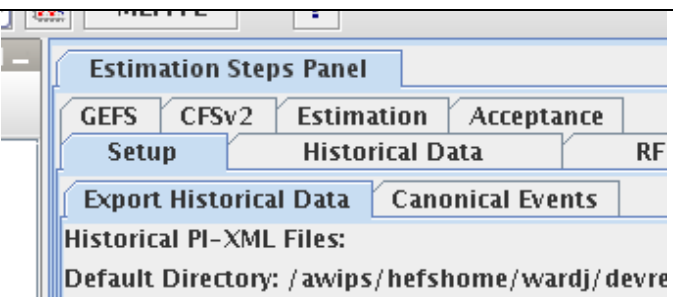

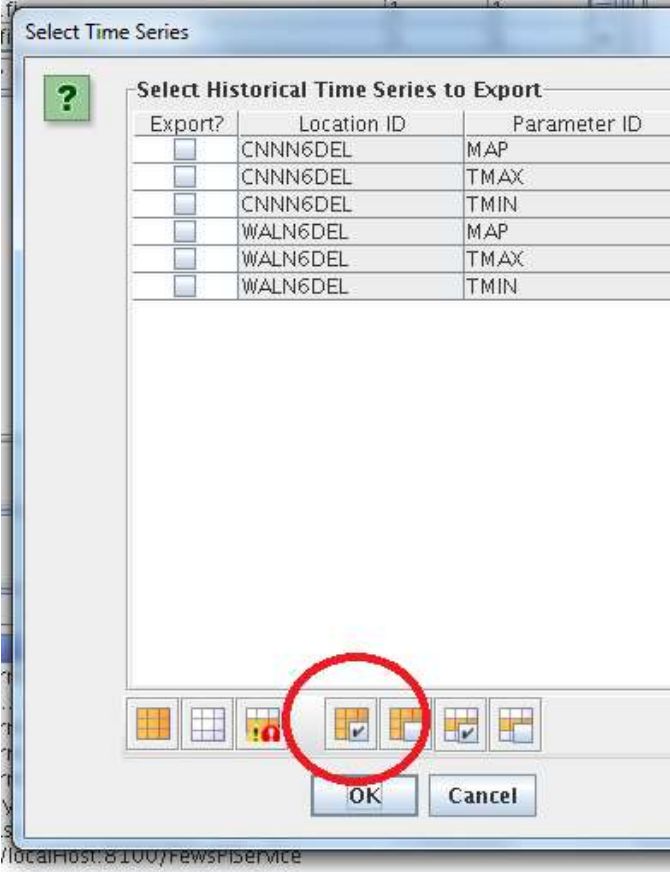
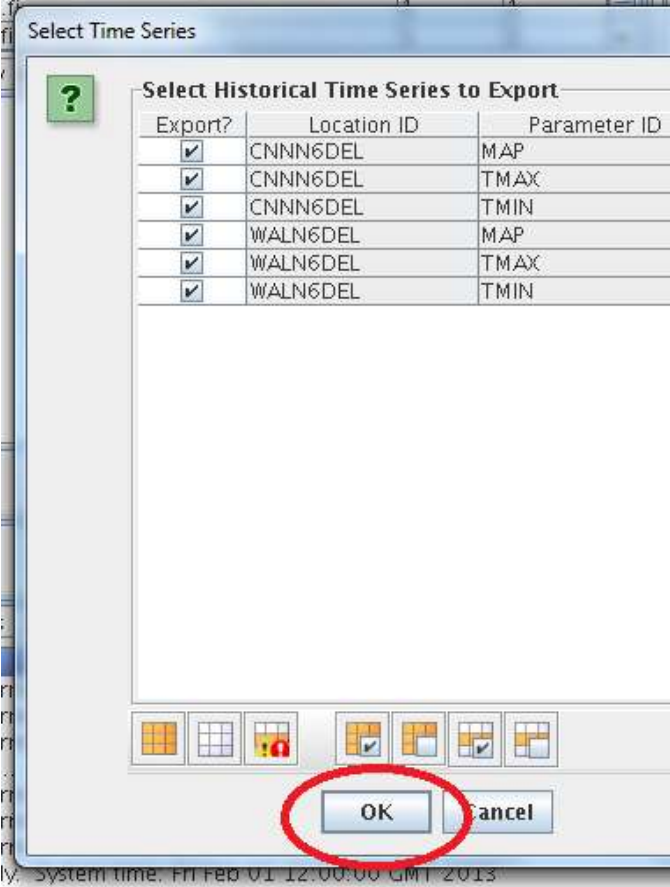
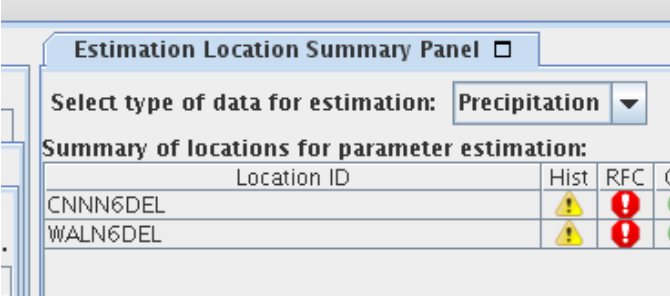


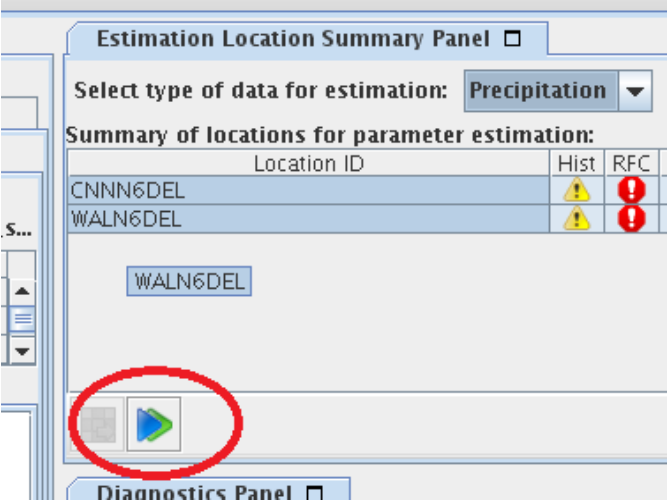
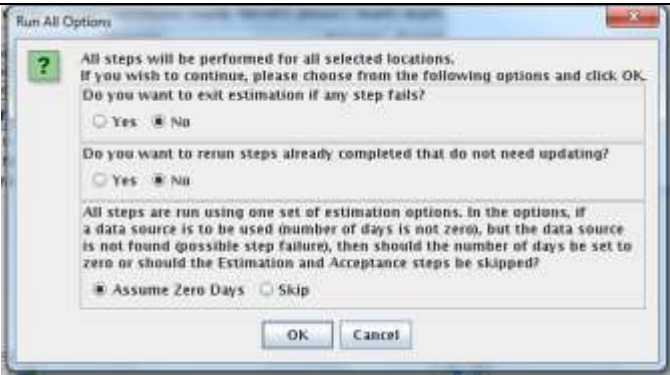
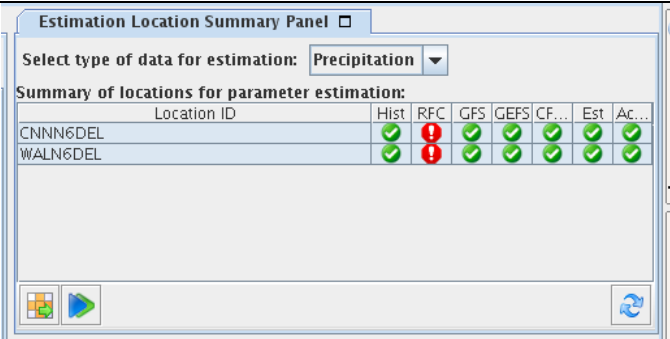
Figure 1

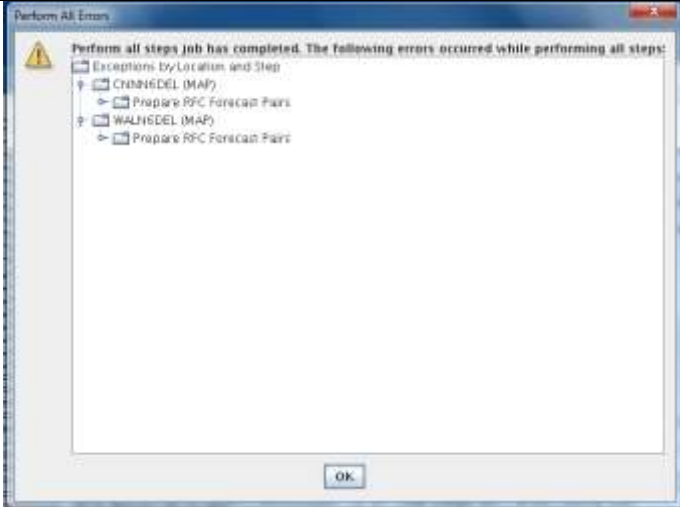
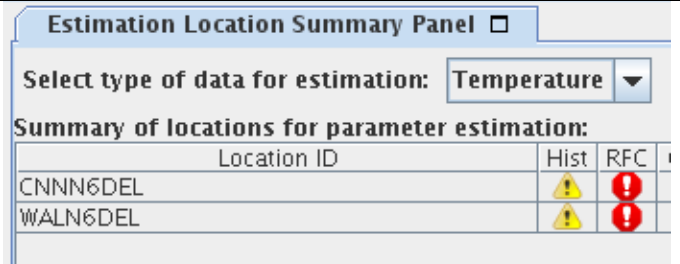
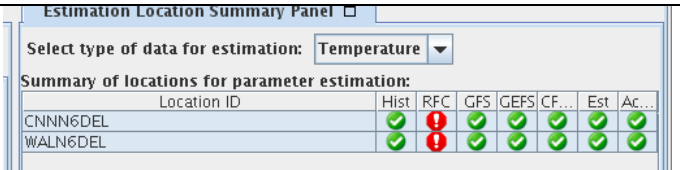
#	Action	Expected Results
5	Click in the CHPS Logs Panel , press the <F12 key>, and press the <J> key to open the Database Viewer .	

#	Action	Expected Results
12	Click on the Reconnect to CHPS PI-service Button , enter your PI-service port number (in this example 8100), and click OK.	
13	When successfully connected, the Reconnect to CHPS PI-service Button (highlighted in the red box) will show a green checkmark and the Export Time Series from CHPS DB Button (highlighted in the red box) will be enabled.	
14	Select Export Historical Data Tab in the Setup Subpanel of the Estimation Steps Panel .	
15	Click on the Export Time Series from CHPS DB Button .	

#	Action	Expected Results																					
16	Click on the Check All Rows for Export Button to check all rows in the table.	 <p>The screenshot shows a 'Select Time Series' dialog box. It contains a table titled 'Select Historical Time Series to Export' with the following data:</p> <table border="1"> <thead> <tr> <th>Export?</th> <th>Location ID</th> <th>Parameter ID</th> </tr> </thead> <tbody> <tr><td><input type="checkbox"/></td><td>CINN6DEL</td><td>MAP</td></tr> <tr><td><input type="checkbox"/></td><td>CINN6DEL</td><td>TMAX</td></tr> <tr><td><input type="checkbox"/></td><td>CINN6DEL</td><td>TMIN</td></tr> <tr><td><input type="checkbox"/></td><td>WALN6DEL</td><td>MAP</td></tr> <tr><td><input type="checkbox"/></td><td>WALN6DEL</td><td>TMAX</td></tr> <tr><td><input type="checkbox"/></td><td>WALN6DEL</td><td>TMIN</td></tr> </tbody> </table> <p>At the bottom of the dialog, a toolbar contains several icons. The icon representing 'Check All' (a grid with a checkmark) is circled in red. Below the toolbar are 'OK' and 'Cancel' buttons.</p>	Export?	Location ID	Parameter ID	<input type="checkbox"/>	CINN6DEL	MAP	<input type="checkbox"/>	CINN6DEL	TMAX	<input type="checkbox"/>	CINN6DEL	TMIN	<input type="checkbox"/>	WALN6DEL	MAP	<input type="checkbox"/>	WALN6DEL	TMAX	<input type="checkbox"/>	WALN6DEL	TMIN
Export?	Location ID	Parameter ID																					
<input type="checkbox"/>	CINN6DEL	MAP																					
<input type="checkbox"/>	CINN6DEL	TMAX																					
<input type="checkbox"/>	CINN6DEL	TMIN																					
<input type="checkbox"/>	WALN6DEL	MAP																					
<input type="checkbox"/>	WALN6DEL	TMAX																					
<input type="checkbox"/>	WALN6DEL	TMIN																					

#	Action	Expected Results																					
17	When all of the time series are selected, click OK .	 <p>The screenshot shows a 'Select Time Series' dialog box. It contains a table titled 'Select Historical Time Series to Export' with the following data:</p> <table border="1"> <thead> <tr> <th>Export?</th> <th>Location ID</th> <th>Parameter ID</th> </tr> </thead> <tbody> <tr><td><input checked="" type="checkbox"/></td><td>CNNN6DEL</td><td>MAP</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>CNNN6DEL</td><td>TMAX</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>CNNN6DEL</td><td>TMIN</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>WALN6DEL</td><td>MAP</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>WALN6DEL</td><td>TMAX</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>WALN6DEL</td><td>TMIN</td></tr> </tbody> </table> <p>The 'OK' button at the bottom right is circled in red.</p>	Export?	Location ID	Parameter ID	<input checked="" type="checkbox"/>	CNNN6DEL	MAP	<input checked="" type="checkbox"/>	CNNN6DEL	TMAX	<input checked="" type="checkbox"/>	CNNN6DEL	TMIN	<input checked="" type="checkbox"/>	WALN6DEL	MAP	<input checked="" type="checkbox"/>	WALN6DEL	TMAX	<input checked="" type="checkbox"/>	WALN6DEL	TMIN
Export?	Location ID	Parameter ID																					
<input checked="" type="checkbox"/>	CNNN6DEL	MAP																					
<input checked="" type="checkbox"/>	CNNN6DEL	TMAX																					
<input checked="" type="checkbox"/>	CNNN6DEL	TMIN																					
<input checked="" type="checkbox"/>	WALN6DEL	MAP																					
<input checked="" type="checkbox"/>	WALN6DEL	TMAX																					
<input checked="" type="checkbox"/>	WALN6DEL	TMIN																					
18	Select "Precipitation" in the Select type of data for estimation Drop down menu in the Location Summary Panel .	 <p>The screenshot shows the 'Estimation Location Summary Panel'. The 'Select type of data for estimation' dropdown is set to 'Precipitation'. Below, a table shows the 'Summary of locations for parameter estimation' with the following data:</p> <table border="1"> <thead> <tr> <th>Location ID</th> <th>Hist</th> <th>RFC</th> </tr> </thead> <tbody> <tr> <td>CNNN6DEL</td> <td>⚠</td> <td>❗</td> </tr> <tr> <td>WALN6DEL</td> <td>⚠</td> <td>❗</td> </tr> </tbody> </table>	Location ID	Hist	RFC	CNNN6DEL	⚠	❗	WALN6DEL	⚠	❗												
Location ID	Hist	RFC																					
CNNN6DEL	⚠	❗																					
WALN6DEL	⚠	❗																					

#	Action	Expected Results
19	Shift + Click to select all rows and click on the Run All Button.	
20	<p>Select OK in the Run All Options window. The parameters will be estimated from the Historical, GFS, GEFS, and the CFSv2 data sources. The RFC data source is not available.</p> <p>(If you wish to add RFC data, see Appendix B and Appendix C below.)</p> <p>A progress dialog will open to display parameter estimation progress.</p> <p>Parameter estimation may take a few minutes.</p>	
21	When finished, all the boxes except RFC should be checked green in the Summary of location for parameter estimation Table.	


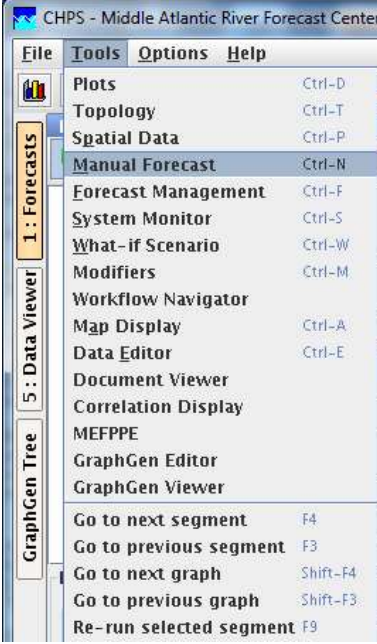
#	Action	Expected Results																								
22	You may see a Perform All Errors Dialog alerting you to missing RFC data. Click OK .																									
23	As an additional check, the directory <mefp_root_dir>/mefpParameters should contain the generated and accepted *.parameter.tgz files.	CNNN6DEL.precipitation.mefp.parameters.tgz WALN6DEL.precipitation.mefp.parameters.tgz																								
24	Select “Temperature” in the Select type of data for estimation drop down menu in the Estimation Location Summary Panel and perform steps 19 & 20 again.	 <table><thead><tr><th>Location ID</th><th>Hist</th><th>RFC</th></tr></thead><tbody><tr><td>CNNN6DEL</td><td></td><td></td></tr><tr><td>WALN6DEL</td><td></td><td></td></tr></tbody></table>	Location ID	Hist	RFC	CNNN6DEL			WALN6DEL																	
Location ID	Hist	RFC																								
CNNN6DEL																										
WALN6DEL																										
25	All the check boxes, except RFC, should be green.	 <table><thead><tr><th>Location ID</th><th>Hist</th><th>RFC</th><th>GFS</th><th>GEFS</th><th>CF...</th><th>Est</th><th>Ac...</th></tr></thead><tbody><tr><td>CNNN6DEL</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>WALN6DEL</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>	Location ID	Hist	RFC	GFS	GEFS	CF...	Est	Ac...	CNNN6DEL								WALN6DEL							
Location ID	Hist	RFC	GFS	GEFS	CF...	Est	Ac...																			
CNNN6DEL																										
WALN6DEL																										
26	As an additional check, the directory <mefp_root_dir>/mefpParameters should contain the generated and accepted *.parameter.tgz files.	CNNN6DEL.temperature.mefp.parameters.tgz WALN6DEL.temperature.mefp.parameters.tgz																								

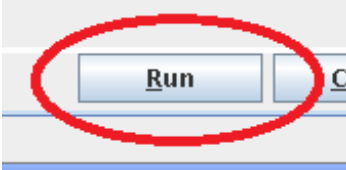
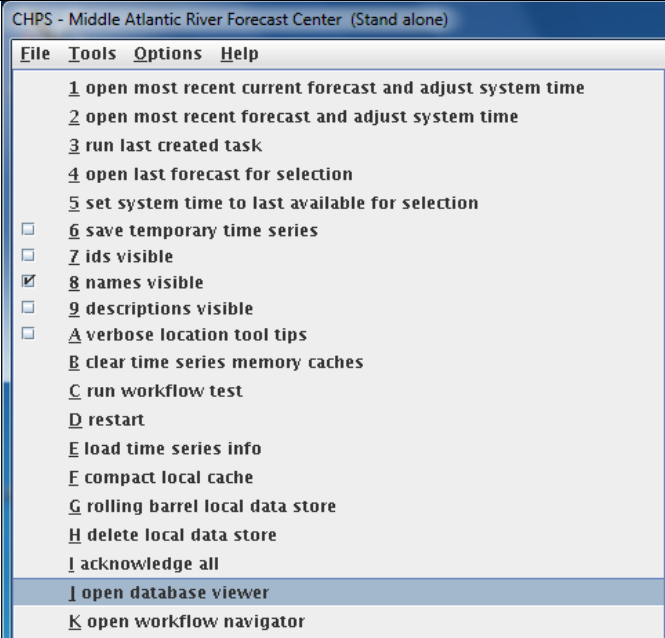

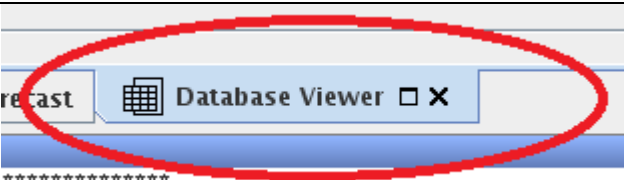
2.3 EnsPost PE (Optional)

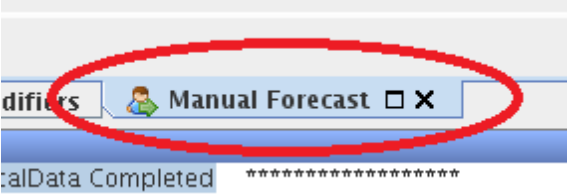
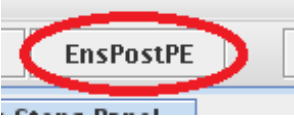




2.3.1 Test Prerequisite

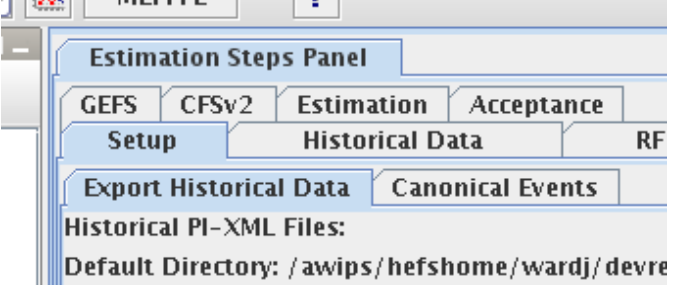

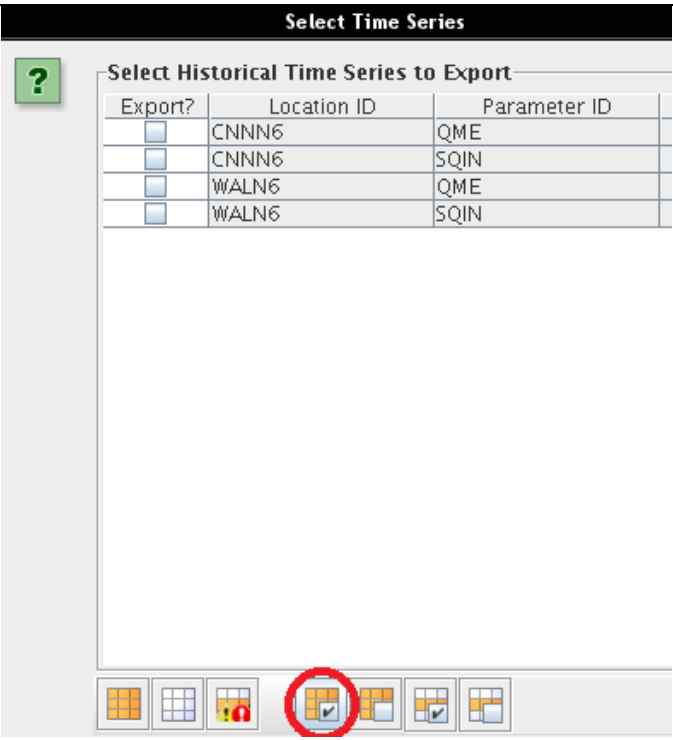
CHPS is configured with the EnsPostPE components as described in the document *EnsPostPE Configuration Guide*. Below is the same information from the confirmation section of the configuration guide. The directories should be populated with datacard files and pixml files.

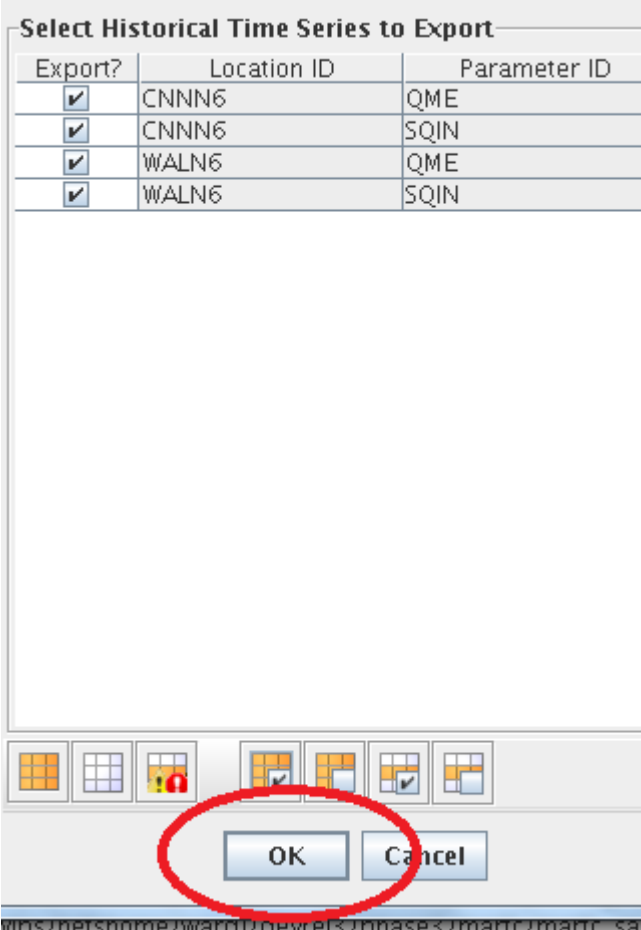
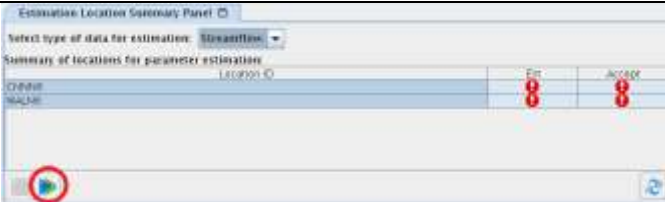
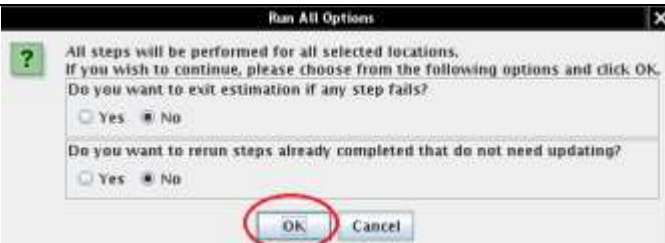
2.3.2 Test Procedure

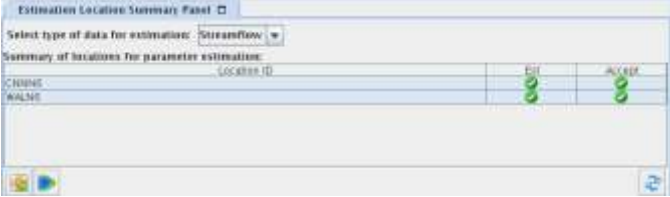
#	Action	Expected Results
1	<p>Start FEWS using the installation standalone:</p> <pre>cd <region_dir></pre> <pre>cd ..</pre> <pre>./hefsPlugins/fews_hefsPlugins.sh ##rfc_sa</pre> <p>&</p>	<p>FEWS will be started. The splash screen displayed will vary by RFC. The default splash screen is:</p>  <p>After a short time, the CHPS interface will open.</p>
2	<p>In CHPS, run the “ImportEnsPostPEHistoricalData” workflow.</p> <p>Choose Tools (menu), Manual Forecast (menu option).</p>	
3	<p>Under Workflow (pull down menu), choose ImportEnsPostPEHistoricalData. It may be the last Workflow.</p>	

#	Action	Expected Results
4	Click Run (button). 	Output (in the CHPS log area) will have “Workflow ImportEnsPostPEHistoricalData Completed”. The historical datacards and simulated pixml files have been imported.
5	Click in the Logs panel , hit the F12 key, and hit the J key to open the database viewer .	
6	The imported data should be present.	
7	Close the Database Viewer by clicking on the X at the bottom of the window.	

#	Action	Expected Results
8	Close the Manual Forecast by clicking on the X at the bottom of the window.	
9	Start the EnsPostPE by clicking on the in the toolbar of the CHPS interface.	
10	The PI-service will be disconnected.	
11	Scroll the Logs panel to find your PI-service port number (here 8100).	
12	Click on the PI-service icon, enter your PI-service port number (8100 in this example), and click OK.	
13	When successfully connected, two database icons should be green.	

#	Action	Expected Results															
14	Select Export Historical Data in the Setup subpanel of the Estimation Steps Panel .	 <p>The screenshot shows the 'Estimation Steps Panel' with tabs for 'GEFS', 'CFSv2', 'Estimation', and 'Acceptance'. The 'Setup' subpanel is active, showing 'Export Historical Data' and 'Canonical Events' buttons. Below these, it says 'Historical PI-XML Files: Default Directory: /awips/hefshome/wardj/devre'.</p>															
15	Click on the Export Time Series icon.	 <p>The screenshot shows a toolbar with several icons. The 'Export Time Series' icon, which depicts a database cylinder with an arrow, is circled in red.</p>															
16	Select all time series to export by pressing the "Select All" button.	 <p>The screenshot shows the 'Select Time Series' dialog box. It has a title bar 'Select Time Series' and a green question mark icon. The main area is titled 'Select Historical Time Series to Export' and contains a table with columns 'Export?', 'Location ID', and 'Parameter ID'. The table lists four entries: CNN6 QME, CNN6 SQIN, WALN6 QME, and WALN6 SQIN. At the bottom, there are several icons, and the 'Select All' icon (a grid with a checkmark) is circled in red.</p> <table border="1"> <thead> <tr> <th>Export?</th> <th>Location ID</th> <th>Parameter ID</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td>CNN6</td> <td>QME</td> </tr> <tr> <td><input type="checkbox"/></td> <td>CNN6</td> <td>SQIN</td> </tr> <tr> <td><input type="checkbox"/></td> <td>WALN6</td> <td>QME</td> </tr> <tr> <td><input type="checkbox"/></td> <td>WALN6</td> <td>SQIN</td> </tr> </tbody> </table>	Export?	Location ID	Parameter ID	<input type="checkbox"/>	CNN6	QME	<input type="checkbox"/>	CNN6	SQIN	<input type="checkbox"/>	WALN6	QME	<input type="checkbox"/>	WALN6	SQIN
Export?	Location ID	Parameter ID															
<input type="checkbox"/>	CNN6	QME															
<input type="checkbox"/>	CNN6	SQIN															
<input type="checkbox"/>	WALN6	QME															
<input type="checkbox"/>	WALN6	SQIN															

#	Action	Expected Results															
17	When all of the time series are selected, click OK.	 <p>Select Historical Time Series to Export</p> <table border="1"> <thead> <tr> <th>Export?</th> <th>Location ID</th> <th>Parameter ID</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/></td> <td>CENN6</td> <td>QME</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>CENN6</td> <td>SQIN</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>WALN6</td> <td>QME</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>WALN6</td> <td>SQIN</td> </tr> </tbody> </table> <p>OK Cancel</p>	Export?	Location ID	Parameter ID	<input checked="" type="checkbox"/>	CENN6	QME	<input checked="" type="checkbox"/>	CENN6	SQIN	<input checked="" type="checkbox"/>	WALN6	QME	<input checked="" type="checkbox"/>	WALN6	SQIN
Export?	Location ID	Parameter ID															
<input checked="" type="checkbox"/>	CENN6	QME															
<input checked="" type="checkbox"/>	CENN6	SQIN															
<input checked="" type="checkbox"/>	WALN6	QME															
<input checked="" type="checkbox"/>	WALN6	SQIN															
18	Shift + Click to select all Location ID rows, and then click on the Run All double arrow.	 <p>Estimation Location Summary Panel</p> <p>Select type of data for estimation: Steadystate</p> <p>Summary of locations for parameter estimation:</p> <table border="1"> <thead> <tr> <th>Location ID</th> <th>Fit</th> <th>Accept</th> </tr> </thead> <tbody> <tr> <td>CENN6</td> <td>8</td> <td>8</td> </tr> <tr> <td>WALN6</td> <td>8</td> <td>8</td> </tr> </tbody> </table> <p>Run All</p>	Location ID	Fit	Accept	CENN6	8	8	WALN6	8	8						
Location ID	Fit	Accept															
CENN6	8	8															
WALN6	8	8															
19	Select OK in the Run All Options window.	 <p>Run All Options</p> <p>All steps will be performed for all selected locations. If you wish to continue, please choose from the following options and click OK.</p> <p>Do you want to exit estimation if any step fails?</p> <p><input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>Do you want to rerun steps already completed that do not need updating?</p> <p><input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>OK Cancel</p>															


#	Action	Expected Results
20	When finished, all the boxes should be checked green.	
21	As an additional check, the directory <code><ens_post_root_dir>/ensPostParameters</code> should contain the *.parameter.tgz files.	CNNN6.SQIN.enspost.parameters.tgz WALN6.SQIN.enspost.parameters.tgz

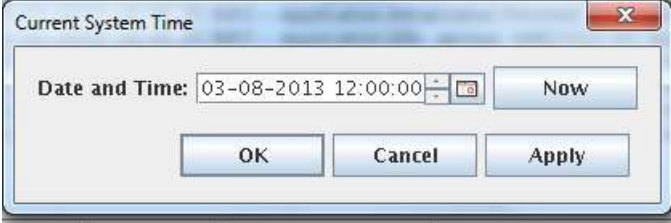
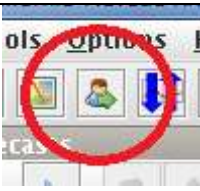
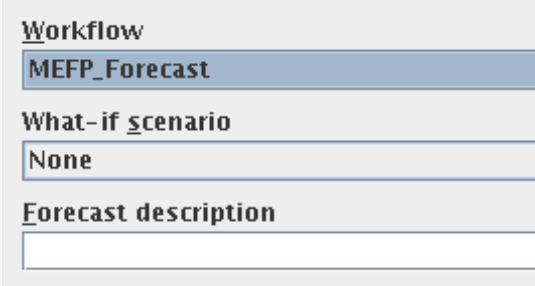
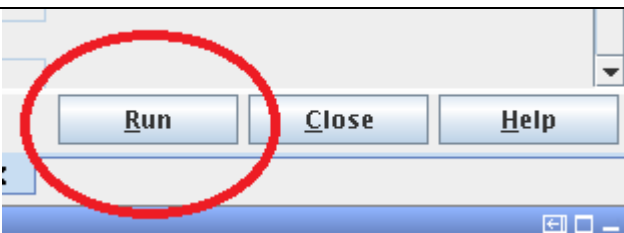
2.4 MEFP Forecast

2.4.1 Test prerequisite

CHPS is configured with the MEFP components as described in the document *MEFP Configuration Guide: Forecast*. Below is the same information from the confirmation section of the configuration guide. The data ingest components have been installed, and for a given forecast time (T0, system time), the GEFS and CFSv2 gridded forecasts must be present.

2.4.2 Test Procedure

#	Action	Expected Results
1	Start FEWS using the installation standalone: <pre>cd <region_dir> cd .. ./hefsPlugins/fews_hefsPlugins.sh ##rfc_sa &</pre>	FEWS will be started. The splash screen displayed will vary by RFC. The default splash screen is:  After a short time, the CHPS interface will open.

#	Action	Expected Results
2	Only perform this step if the current system time is not correct for testing. Click on the Current System Time label at the bottom of the CHPS interface so that the Current System Time dialog opens. Set the system time appropriately and click OK .	
3	Click on the Manual Forecast Button .	
4	The Manual Forecast Panel will open, allowing you to select a workflow to run. In the Workflow List, select the MEFP_Forecast workflow and press the F12 key.	
5	In the Manual Forecast Panel , click Run.	
6	When MEFP Forecast is done, you should see "Workflow MEFP_Forecast Completed" in the logs panel: (see Figure 2 below)	

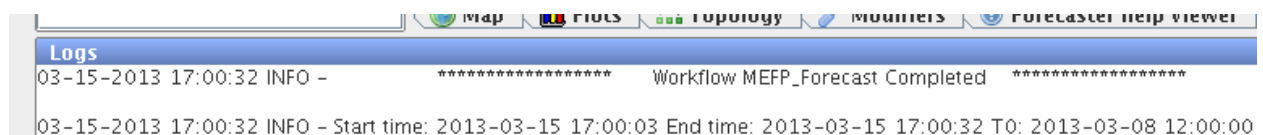
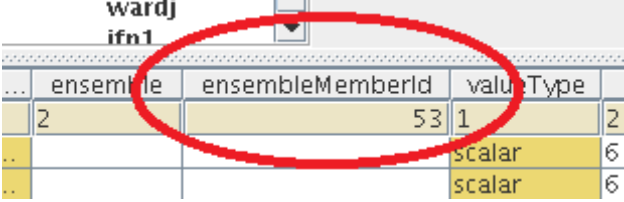
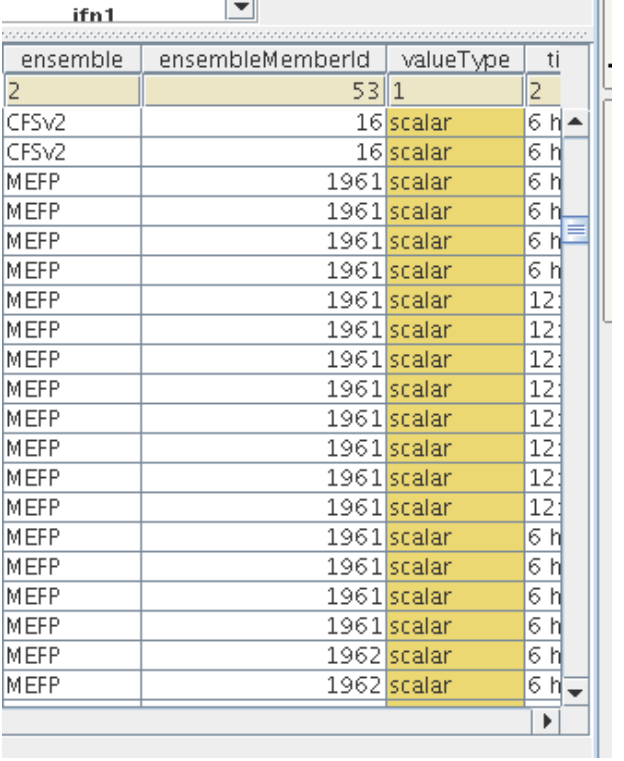


Figure 2

#	Action	Expected Results
7	To verify that ensembles were generated, click in the Logs Panel , hit the <F12> key, and hit the <J> key to open the Database Viewer .	<p> <u>1</u> open most recent current forecast <u>2</u> open most recent forecast and adj <u>3</u> run last created task <u>4</u> open last forecast for selection <u>5</u> set system time to last available fo <u>6</u> save temporary time series <u>7</u> ids visible <u>8</u> names visible <u>9</u> descriptions visible <u>A</u> verbose location tool tips <u>B</u> clear time series memory caches <u>C</u> run workflow test <u>D</u> restart <u>E</u> load time series info <u>F</u> compact local cache <u>G</u> rolling barrel local data store <u>H</u> delete local data store <u>I</u> acknowledge all <u>J</u> open database viewer <u>K</u> open workflow navigator </p>
8	MEFP_Forecast should be the last workflow you ran. Double click to open it. See Figure 3 below	

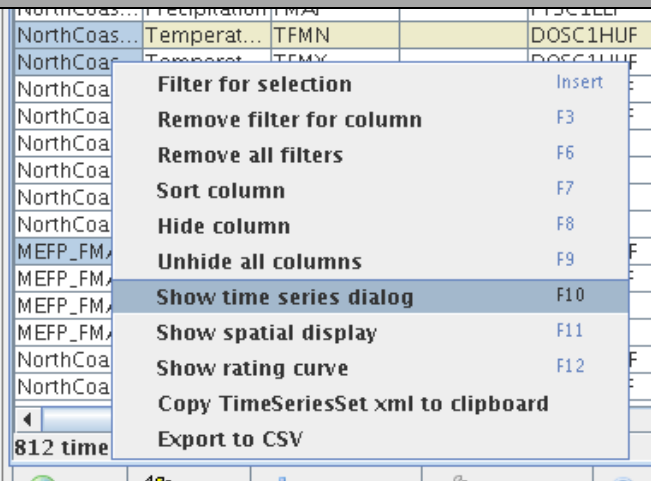
moduleInst	group	parameterId	qualifiers	locationId	locationName	x	y	timeSeries	ensemble	ensemble	valueT
13	3	4	2	4	4			1	2	53	1
MEFP_GEF...	Precipitation	FMAP	GEFS	DOSC1HUF	MF EEL -	-123.001	39.85	external f			scalar
MEFP_GEF...	Precipitation	FMAP	GEFS	DOSC1HLF	MF EEL -	-123.14	39.73	external f			scalar
MEFP_GEF...	Precipitation	FMAP	GEFS	FTSC1LUF	EEL - FT S	-122.85	39.48	external f			scalar
MEFP_GEF...	Precipitation	FMAP	GEFS	FTSC1LLF	EEL - FT S	-123.37	39.73	external f			scalar
MEFP_GEF...	Temperat...	TFMN	GEFS	DOSC1HUF	MF EEL -	-123.001	39.85	external f			scalar
MEFP_GEF...	Temperat...	TFMN	GEFS	DOSC1HLF	MF EEL -	-123.14	39.73	external f			scalar
MEFP_GEF...	Temperat...	TFMN	GEFS	FTSC1LUF	EEL - FT S	-122.85	39.48	external f			scalar
MEFP_GEF...	Temperat...	TFMN	GEFS	FTSC1LLF	EEL - FT S	-123.37	39.73	external f			scalar
MEFP_GEF...	Temperat...	TFMX	GEFS	DOSC1HUF	MF EEL -	-123.001	39.85	external f			scalar
MEFP_GEF...	Temperat...	TFMX	GEFS	DOSC1HLF	MF EEL -	-123.14	39.73	external f			scalar
MEFP_GEF...	Temperat...	TFMX	GEFS	FTSC1LUF	EEL - FT S	-122.85	39.48	external f			scalar
MEFP_GEF...	Temperat...	TFMX	GEFS	FTSC1LLF	EEL - FT S	-123.37	39.73	external f			scalar
MEFP_GEF...	Temperat...	TFMN	GEFS	DOSC1HUF	MF EEL -	-123.001	39.85	external f			scalar
MEFP_GEF...	Temperat...	TFMN	GEFS	DOSC1HLF	MF EEL -	-123.14	39.73	external f			scalar
MEFP_GEF...	Temperat...	TFMN	GEFS	FTSC1LUF	EEL - FT S	-122.85	39.48	external f			scalar
MEFP_GEF...	Temperat...	TFMN	GEFS	FTSC1LLF	EEL - FT S	-123.37	39.73	external f			scalar
MEFP_GEF...	Temperat...	TFMX	GEFS	DOSC1HUF	MF EEL -	-123.001	39.85	external f			scalar
MEFP_GEF...	Temperat...	TFMX	GEFS	DOSC1HLF	MF EEL -	-123.14	39.73	external f			scalar
MEFP_GEF...	Temperat...	TFMX	GEFS	FTSC1LUF	EEL - FT S	-122.85	39.48	external f			scalar
MEFP_GEF...	Temperat...	TFMX	GEFS	FTSC1LLF	EEL - FT S	-123.37	39.73	external f			scalar

Figure 3

#	Action	Expected Results
9	Click on the “ ensembleMemberId ” column to sort by it. You may have to expand the column to see the full name.	
10	Scroll down to ensembleMemberId (year) 1961.	
11	Pick a locationId . This will vary between RFCs. In our example, locationId DOSC1HUF was chosen. <Shift> + left click to select the TFMN, TFMX, and FMAT for that location, and for one ensemble member index (1961, in Figure 4 below).	

moduleInst	group	parameterId	qualifiers	locationId	locationNa	x	y	timeSeries	ensemble	ensembleMemberId	valueType	ti
13	3	4	2	4	4			1	2	S3 1	2	
NorthCoas	Temperat...	TFMX	CFSv2	FTSC1LUF	EEL - FT S	-122.85	39.48	external f	CFSv2	16	scalar	6 h
NorthCoas	Temperat...	TFMX	CFSv2	FTSC1LUF	EEL - FT S	-123.37	39.73	external f	CFSv2	16	scalar	6 h
NorthCoas	Precipitation	FMAP		DOSC1HUF	MF EEL -	-123.001	39.85	external f	MEFP	1961	scalar	6 h
NorthCoas	Precipitation	FMAP		DOSC1HUF	MF EEL -	-123.14	39.73	external f	MEFP	1961	scalar	6 h
NorthCoas	Precipitation	FMAP		FTSC1LUF	EEL - FT S	-122.85	39.48	external f	MEFP	1961	scalar	6 h
NorthCoas	Precipitation	FMAP		FTSC1LUF	EEL - FT S	-123.37	39.73	external f	MEFP	1961	scalar	6 h
NorthCoas	Temperat...	TFMN		DOSC1HUF	MF EEL -	-123.001	39.85	external f	MEFP	1961	scalar	12
NorthCoas	Temperat...	TFMX		DOSC1HUF	MF EEL -	-123.001	39.85	external f	MEFP	1961	scalar	12
NorthCoas	Temperat...	TFMN		DOSC1HUF	MF EEL -	-123.14	39.73	external f	MEFP	1961	scalar	12
NorthCoas	Temperat...	TFMX		DOSC1HUF	MF EEL -	-123.14	39.73	external f	MEFP	1961	scalar	12
NorthCoas	Temperat...	TFMN		FTSC1LUF	EEL - FT S	-122.85	39.48	external f	MEFP	1961	scalar	12
NorthCoas	Temperat...	TFMX		FTSC1LUF	EEL - FT S	-122.85	39.48	external f	MEFP	1961	scalar	12
NorthCoas	Temperat...	TFMN		FTSC1LUF	EEL - FT S	-123.37	39.73	external f	MEFP	1961	scalar	12
NorthCoas	Temperat...	TFMX		FTSC1LUF	EEL - FT S	-123.37	39.73	external f	MEFP	1961	scalar	12
MEFP_FMA	Temperat...	FMAF		DOSC1HUF	MF EEL -	-123.001	39.85	external f	MEFP	1961	scalar	6 h
MEFP_FMA	Temperat...	FMAF		DOSC1HUF	MF EEL -	-123.14	39.73	external f	MEFP	1961	scalar	6 h
MEFP_FMA	Temperat...	FMAF		FTSC1LUF	EEL - FT S	-122.85	39.48	external f	MEFP	1961	scalar	6 h
MEFP_FMA	Temperat...	FMAF		FTSC1LUF	EEL - FT S	-123.37	39.73	external f	MEFP	1961	scalar	6 h
NorthCoas	Precipitation	FMAP		DOSC1HUF	MF EEL -	-123.001	39.85	external f	MEFP	1962	scalar	6 h
NorthCoas	Precipitation	FMAP		DOSC1HUF	MF EEL -	-123.14	39.73	external f	MEFP	1962	scalar	6 h

Figure 4

#	Action	Expected Results
12	Right click and select “Show time series dialog”. The Database Viewer will appear. TFMX is shown in red at top, TFMN is shown in blue at top, and generated FMAF is shown on the bottom. See Figure 5 below.	

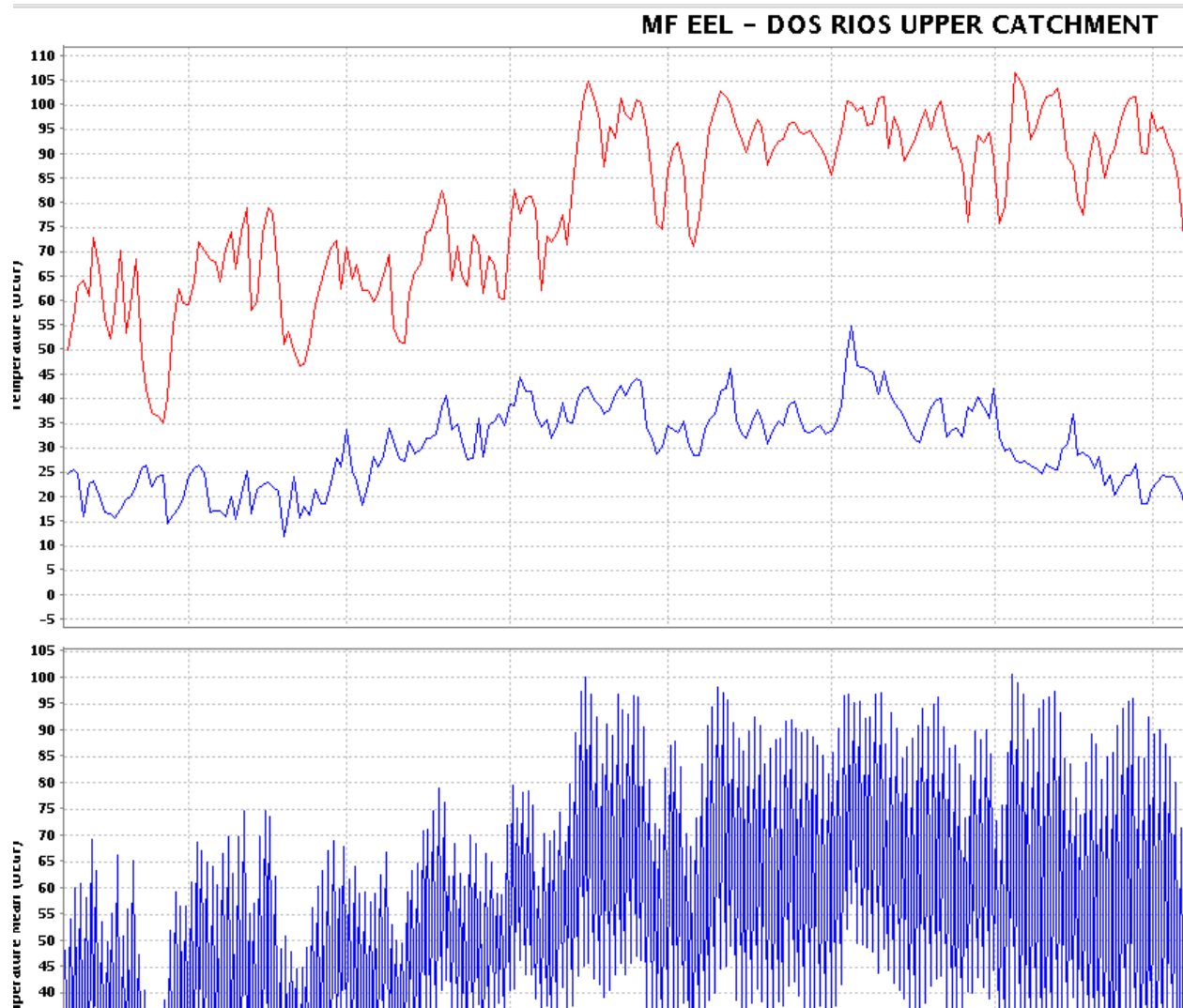


Figure 5

#	Action	Expected Results
13	For a better view, select a region of the Database Viewer by clicking and dragging a small rectangle from upper left to lower right. The generated FMAT should lie between the max and min temps. See Figure 6 below.	

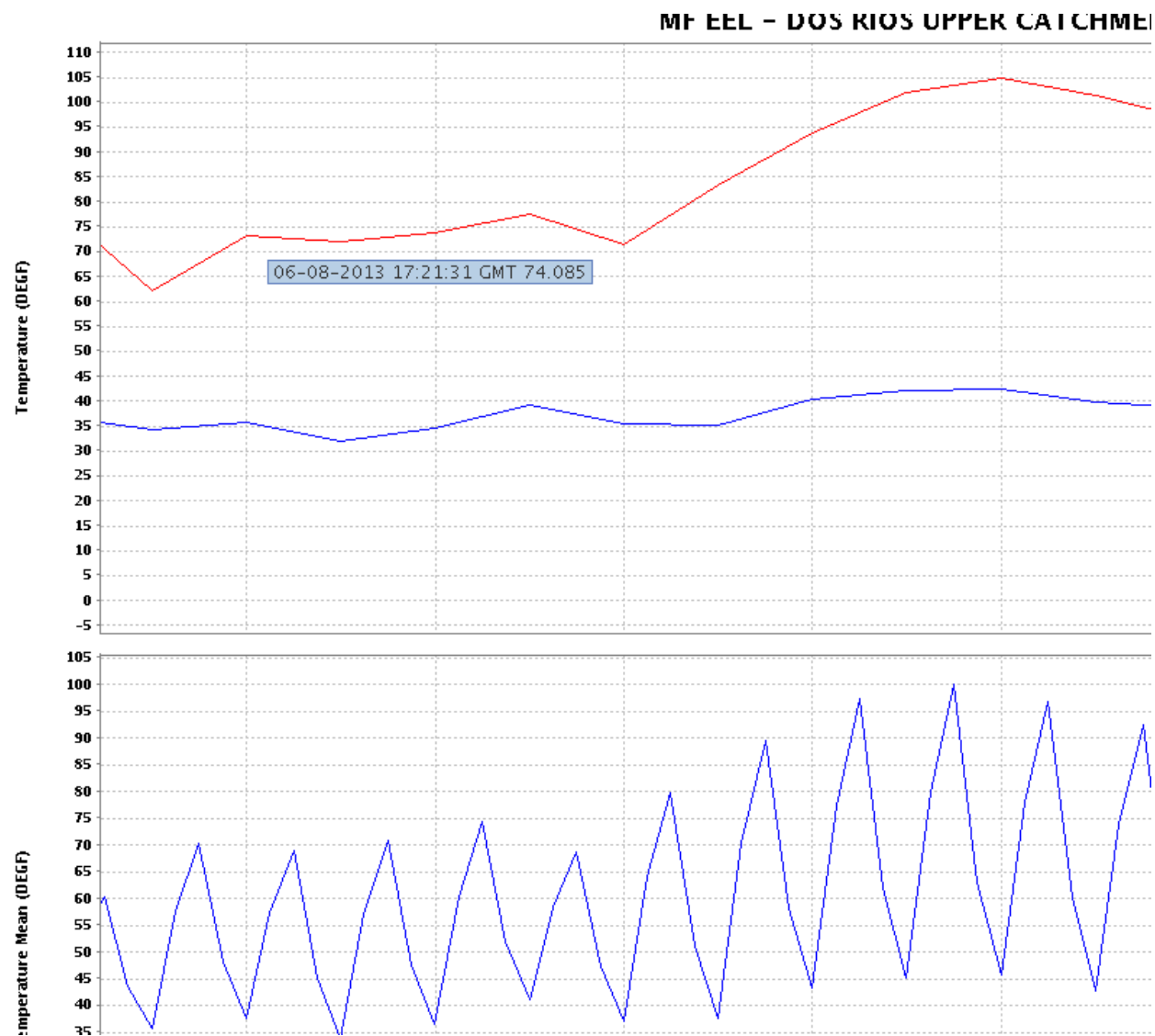


Figure 6

2.5 EnsPost



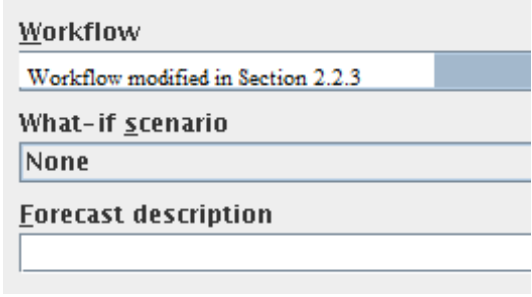
2.5.1 Test Prerequisite

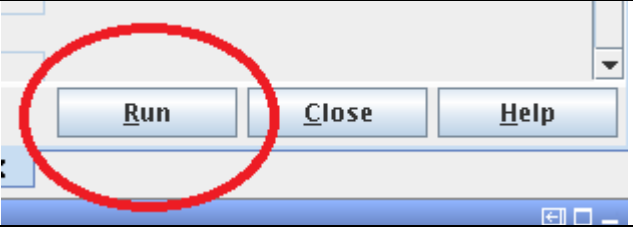
CHPS is configured with the EnsPost components as described in the document *EnsPost Configuration Guide*. Below is the same information from the confirmation section of the configuration guide. EnsPostPE is installed as described in the *EnsPostPE Configuration Guide*. The parameters .tgz file must be in the following format:

<LocationID>.<ParameterID>.enspost.parameters.tgz

Identify a workflow that generates an ensemble of stream flow forecasts. It can be an MEFP-based ensemble (see the *MEFP Configuration Guide: Forecast Components*) or an existing ESP workflow.

2.5.2 Test Procedure

#	Action	Expected Results
1	Start FEWS using the installation standalone: <code>cd <region_dir></code> <code>cd ..</code> <code>./hefsPlugins/fews_hefsPlugins.sh ##rfc_sa</code> <code>&</code>	FEWS will be started. The splash screen displayed will vary by RFC. The default splash screen is:  After a short time, the CHPS interface will open.
2	Click on the Manual Forecast Button .	
3	The Manual Forecast Panel will open, allowing you to select a workflow to run. In the Workflow List, select the workflow modified in the <i>EnsPostPE Configuration Guide</i> .	

#	Action	Expected Results
4	In the Manual Forecast Panel , click Run.	
5	Once the workflow is done.	You should see “Workflow Completed” in the logs panel. For example, “Workflow HEFS Forecast Completed”
6	Open the Database viewer in order to confirm that EnsPost successfully ran.	Select the workflow that was just completed in the database viewer, and find entries with the EnsembleID of HEFSENSPOST.

2.6 GraphGen

2.6.1 Test Prerequisite

CHPS is configured with the GraphGen components as described in the document *HEFS Graphics Generator Products Installation Guide*. Below is the same information from the confirmation section of the configuration guide. A localDataStore containing MEFP generated forecast ensembles, MEFP-based generated streamflow ensembles, and/or EnsPost post-processed streamflow ensembles.

2.6.2 Test Procedure

#	Action	Expected Results
1	Execute the workflow GraphGen_Create_HEFS_Products created in the <i>HEFS Graphics Generator Products Installation Guide</i> via the CHPS interface Manual Forecast Panel as normal (start CHPS, set the PI-service port number, open the panel, show all workflows, select the workflow, and click Run).	The HEFS product files will be created in the standard location (i.e., <i><products_dir></i>) specified by the baseOutputDir run file property (see <i>HEFS Graphics Generator Products Installation Guide</i>). The images will appear similar to Figures 7 - 9 shown below:

- *MEFP Results*: MEFP generated forecast ensembles of 6-hour FMAP and FMAT time series.

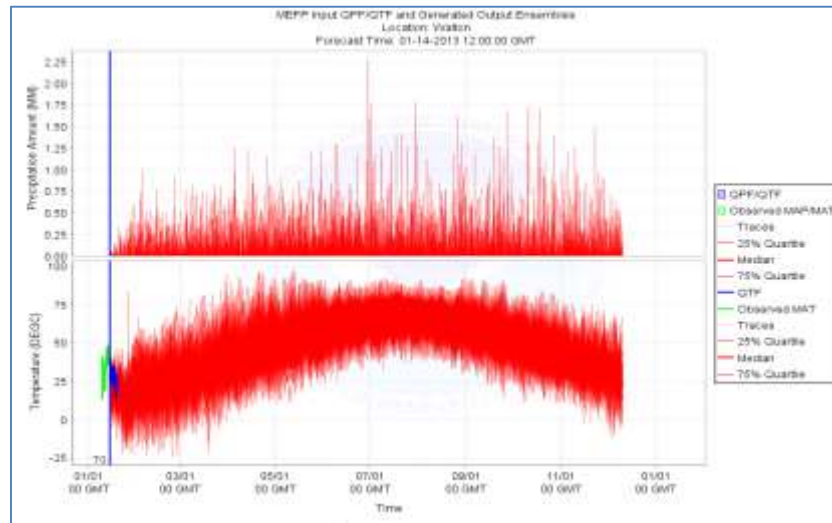


Figure 7

- *HEFS EnsPost Input*: Streamflow ensembles that are input to the HEFS EnsPost. If HEFS EnsPost is not used, the products can be used to display any streamflow ensemble.

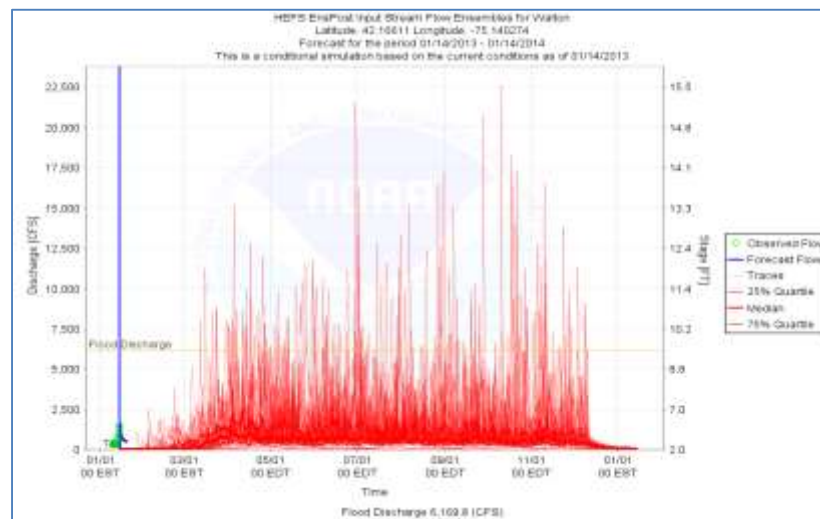


Figure 8

- *HEFS EnsPost Output*: Streamflow ensembles that are post-processed and output by the HEFS EnsPost.

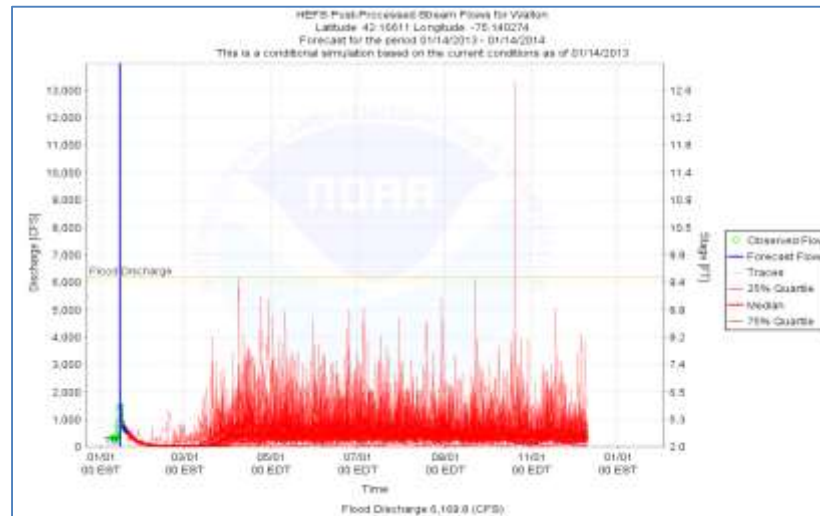


Figure 9

3 Testing Fixes

3.1 List of FogBugz tests

FogBugz ID	Tester	Test Procedure	Title
1231	ABRFC	N/A	EnsPost seasonal discontinuity
1427	ABRFC	Yes	MEFPPE using historical forecast date
1494	ALL	N/A	Probability of Precipitation (PoP) biases in MEFP forecasts
1545	OHD	N/A	EVS failure to aggregate observations to forecast scale

3.2 FogBugz 1427 – MEFPPE using historical forecast date

3.2.1 Description

MEFPPE complains of missing GEFS data when GEFS data is present.

3.2.2 Cause

MEFPPE is using a historical forecast date (1940) instead of the range of the GEFS reforecast time series (through 2014) when calculating canonical event values.

3.2.3 Fix

MEFPPE will look at the time series data instead of using the historical forecast date.

3.2.4 Test Procedure

3.2.4.1 Test Setup

This test uses the regression test stand-alone for parameter estimation. To begin, use the SA to convert the .fi files within the directory

.../Models/hefs/mefppeRunArea/historicalData/.

To XML files (DatabaseViewer, F12, S). After doing so, move all of the .fi files into a backup directory.

3.2.4.2 Test Overview

The test consists of modifying the files in such a way that the error should be triggered and then confirming that it is not. To do so, do the following:

1. Select one location each for each data type, precipitation and temperature, for which historical data already exists within the historicalData directory noted above.
2. Estimate parameters as per usual for the two locations and copy aside the .tgz parameter files created under this directory:

.../Models/hefs/mefppeRunArea/parameters

3. Edit the historical data file within the historicalData directory (noted above) adding or modifying the forecastDate XML element as follows (note that this element must immediately follow the endDate XML element):

```
<forecastDate date="2014-04-29" time="12:00:00"/>
```

4. Estimate parameters again using the new historical data. Untar the old/new parameter files into separate directories. Do a diff on the old/new directories. All the files should be identical, except for historicalTimeSeries.bin and historicalTimeSeries.xml, which differ in the forecastDate. If they are not, then this test fails.

4 Testing Enhancements

4.1 List of enhancement tests

FogBugz ID	Tester	Test Procedure	Title
1059	CNRFC	Yes	Display probabilistic inflow volume accumulation plot
1435	OHD	N\A	Backup MEFPE SFTP server
1438	CBRFC & OHD	N\A	EVS rolling aggregation
1442	ALL (Optional)	Yes	HEFS Aptima product
1479	OHD	N\A	EVS accept NaN as missing value
1483	OHD	N\A	EVS discriminate input time-series by ensembleid
1493	CNRFC	Yes	GraphGen aggregator enhancements
1496	CNRFC	Yes	GraphGen axis display

4.2 FogBugz 1059 – Display probabilistic inflow volume accumulation plot

4.2.1 Description

Probabilistic inflow volume accumulation plot cannot be created using Graphics Generator.

4.2.2 Cause

For a volume accumulation plot, users can only specify a period start, period end, and period time step. A "Computation Time Step" is required to allow either a default (computation time step = period time step) or a user specified time step (similar to the period time step). These changes were delivered previously, but were not sufficient to generate the plots required. For HEFS 1.2.1, an additional option, Prefix with Zero, was added to the **GraphGen Editor** allowing for the lines in the plot to all start from the same value: 0.

4.2.3 Fix

Add Computation Time Step to Graphics Generator. Add Prefix with Zero ability to Graphics Generator.

4.2.4 Test Procedure

The test procedure for FogBugz 1059, 1493 and 1496 is combined below at 4.5.4.

4.3 FogBugz 1442 – HEFS Aptima product

4.3.1 Description

The HEFS "Aptima product" is the first planned HEFS product. OHD will initiate the process of providing this to the public as an experimental product.

4.3.2 Cause

4.3.3 Fix

Installation instructions are given in the HEFS Graphics Generator Product Installation Guide. Instructions for those RFCs that have already installed prior HEFS products are noted below and provided in FogBugz 1442:

<http://schuylkill.nws.noaa.gov:7069/default.asp?1442>

4.3.4 Test Procedure

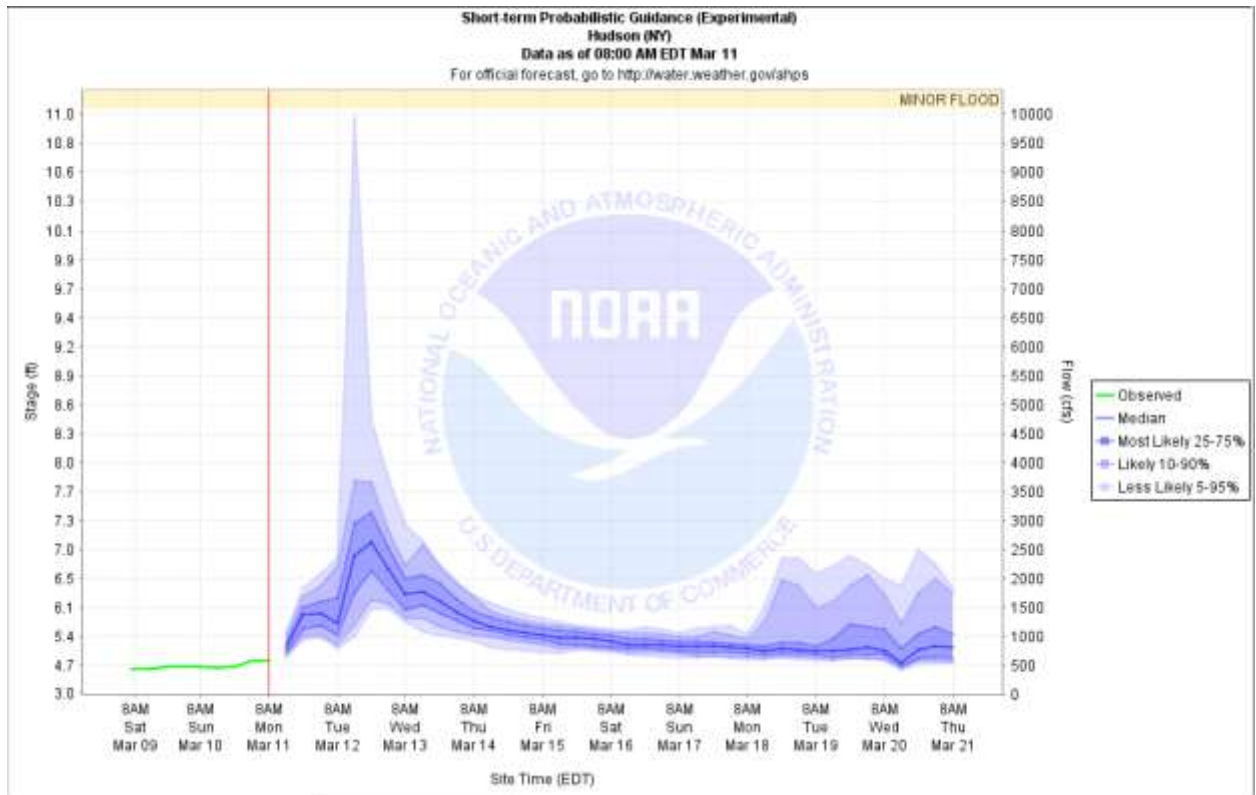
4.3.4.1 Test Setup

This test uses the operational MEFP forecasting configured for viewing the output of the HEFS workflow run via Graphics Generator HEFS products.

4.3.4.2 Test Overview

If the HEFS products have already been installed on the test stand-alone, follow the instructions provided in the FogBugz to install the new version of the HEFS products. Otherwise, install the products from scratch following the instructions provided in the *HEFS Graphics Generator Products Installation Guide*.

When installed, the product should appear similar to the following example (from NERFC):



4.4 FogBugz 1493 – GraphGen aggregator enhancements

4.4.1 Description

Add to the GraphGen aggregators:

1. Relate start/end periods to calendar/water year,
2. When the T0 is within the season of interest, only calculate the residual volume (T0 to end of season),
3. The number of days to peak counter, for a specified season, should start from T0.

4.4.2 Cause

4.4.3 Fix

1. Add two properties to define a time period during which the adapter should generate products. If the T0 is not in that period, then the adapter exits immediately with a warning message but no error. The start/end dates will not care about the year used in the dates, but will focus on months, days, hours, etc.

2. Add an Ignore Missing checkbox to all aggregators (addresses the issue when T0 is within aggregation window).
3. Add a basis date applicable to the counter aggregator. Counter aggregations that involve counting days/timesteps will be performed as currently done, but the output will have a value added to it equal to the difference between the default basis date and this user-set value. The default basis date will be set to "tsStartTime", which matches the current default behavior.

4.4.4 Test Procedure

The test procedure for FogBugz 1059, 1493 and 1496 is combined below at 4.5.4.

4.5 FogBugz 1496 – GraphGen axis display

4.5.1 Description

A number of products use the GraphGen axis translator to plot flow on the primary y axis, and stage on the secondary y axis. However, some of the locations (reservoirs) don't have a rating curve (flow to stage translator). For these plots, an error message is displayed on the secondary y axis. Prefer to not display anything at all on the secondary y axis if a rating curve is not found.

4.5.2 Cause

4.5.3 Fix

If an axis translation fails, a warning message will be generated and that axis will not be visible within the plot.

4.5.4 Test Procedure

4.5.4.1 Test Setup

This test uses the stand-alone for operational ensemble (HEFS or ESP) forecasting that includes the AHPS products.

4.5.4.2 Test Overview

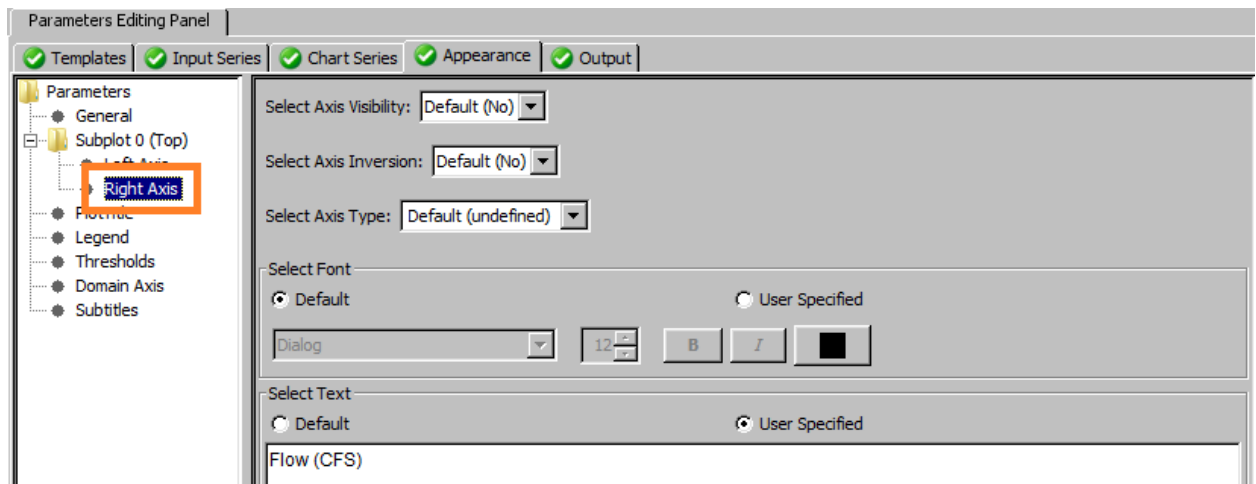
Start the regression stand-alone, select an appropriate segment in the **Forecasts Panel**.

Test Do Not Show Axis if Rating Curve is Not Found

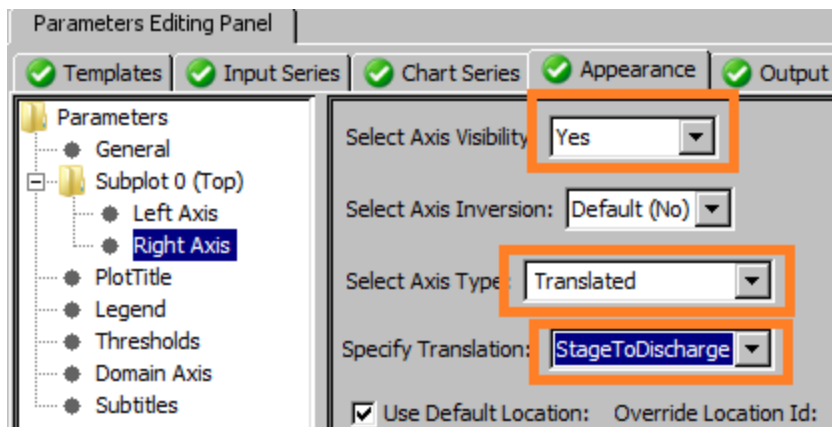
Open up the AHPS product template with id AHPSStageHistograms_5Values in the **GraphGen Editor Panel**. (Test can also be run on AHPSStageHistogram) Do the following:

1. **Action:** Switch to the **Appearance Tabbed Panel**. In the tree on the left, select “Subplot 0 (Top)” and “Right Axis”:

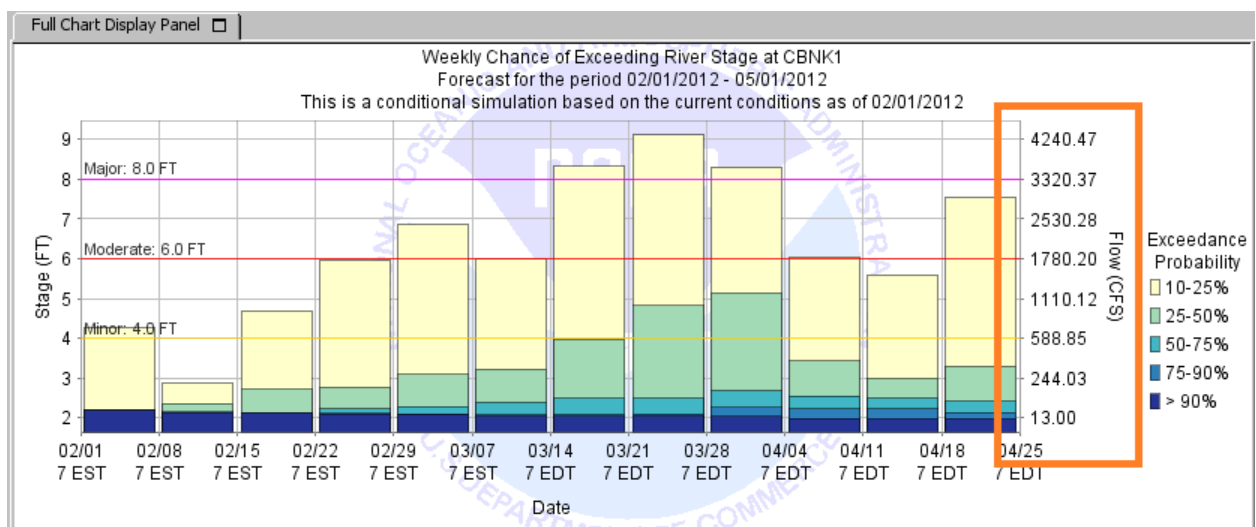
Results: The parameter editing panel will change to the following:



2. **Action:** Make the axis visible, set the type to “Translated”, and select the “StageToDischarge” translation:



Results: If the rating curve is found, in the **Full Chart Display Panel** in the lower right, a right axis will be displayed with flow values converted from the corresponding stage values shown on the left hand axis. For example (note the right axis highlighted by the orange box):



If the rating curve is not found, the right axis will not be visible and a warning similar to the following will be displayed in the **Logs Panel**:

WARN - Error loading axis translator StageToDischarge: The location id 'TESTLOC' does not appear to be valid to acquire a rating curve.

This confirms the enhancement and the next step can be skipped.

3. **Action:** If the rating curve was found in the previous step and the right axis was displayed, then manually change the location id use to be invalid. For example:

Select Axis Visibility: Yes

Select Axis Inversion: Default (No)

Select Axis Type: Translated

Specify Translation: StageToDischarge

☐ Use Default Location: Override Location Id: TESTLOC

ERROR: The location id 'TESTLOC' does not appear to be valid to acquire a rating curve.

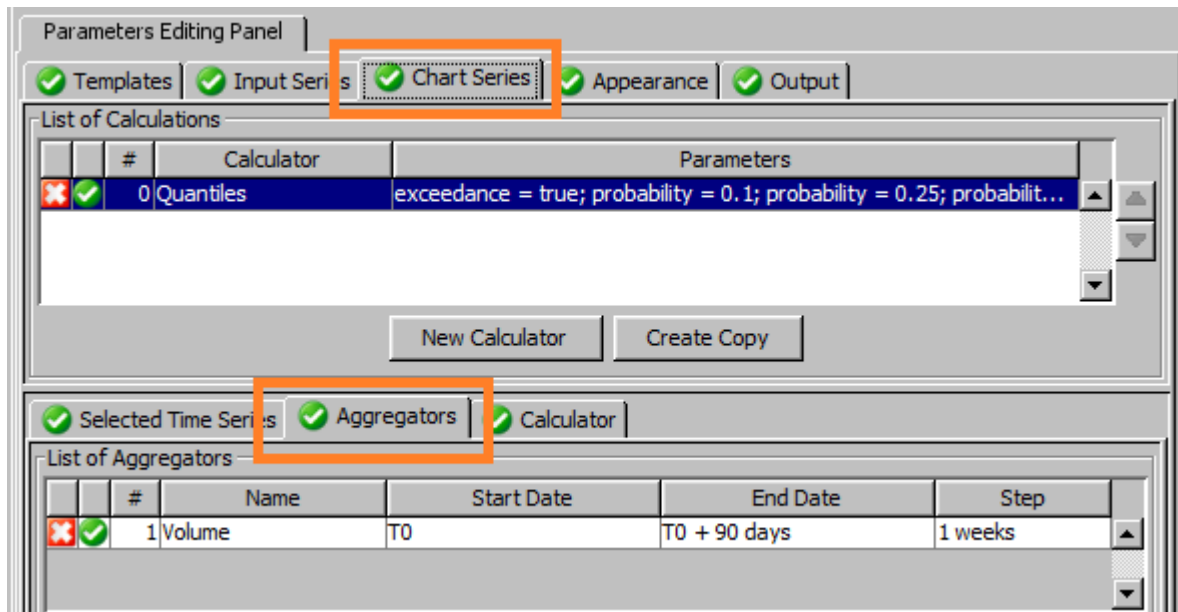
Results: A red-text error message should be displayed below the **Use Default Location Checkbox** and **Override Location Id Text Field** (see example above) explaining that a rating curve could not be found. In the **Full Chart Display Panel**, the right axis should not be visible and the warning message described above will be displayed in the **Logs Panel**.

This completes the test of behavior when the rating curve is not found.

Test Ignore Missing Values Enhancement

Close the **GraphGen Editor Panel** without saving changes to the product template and open up the AHPS product template with id "AHPSVolumeHistogram_5Values" in the **GraphGen Editor Panel**. (Test can also be run on AHPSVolumeHistogram) Do the following:

1. **Action:** Switch to the **Chart Series Tabbed Panel** and to the **Aggregators Sub-Panel**:



2. **Action:** Select the only row in the **List of Aggregators Table**. Change the Computation Time Step to "period" and set the start date to "T0 – 7 days":

☒ Selected Time Series
 ☒ Aggregators
 ☒ Calculator

	Name	Start Date	End Date	Step
<input checked="" type="checkbox"/>	1 Volume	T0 - 7 days	T0 + 90 days	1 period

New Aggregator

Aggregator:
☐ Ignore Missing Values
 ☐ Prefix With Zero

Aggregator Parameters

Period Parameters

Start Date:

End Date:

Computation Time Step:

Aggregation Period: at computation time

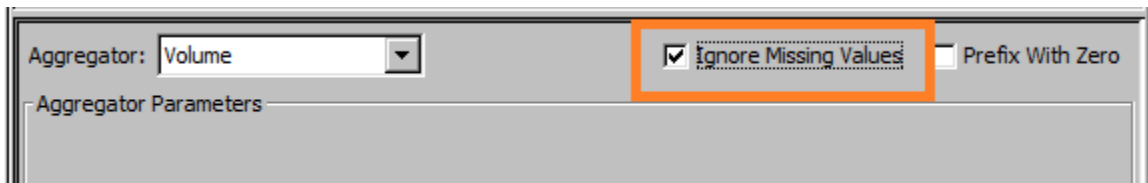
Results: When the row is selected, the **Current Status Panel** will display computed volumes as red dots; note its appearance. After setting the start date, the **Current Status Panel** in the upper right of the editor will display an error message because there is no date between T0 – 7 days and T0 and those missing values cause the aggregation to fail:

Current Status Display Panel ☐

Failed to Update Status Panel:

The aggregated time series do not contain any non-missing values.
 Make sure some of the time series contain non-missing data.

3. **Action:** Check the **Ignore Missing Values** Checkbox:



The screenshot shows a software configuration window. At the top, there is a label 'Aggregator:' followed by a dropdown menu currently displaying 'Volume'. To the right of this is a checkbox labeled 'Ignore Missing Values' which is checked, and another checkbox labeled 'Prefix With Zero' which is unchecked. Below these options is a section titled 'Aggregator Parameters' which is currently collapsed, indicated by a minus sign on the left.

Results: The **Current Status Panel** will display the same computed volumes as before. Also, the **Logs Panel** will display many warning messages similar to the following:

09-10-2014 14:55:21 WARN - The following occurred while performing an sumaggregation on time series [TimeSeries: CBNK1, QINE, ESP, 2010]: At least one missing data value was found and ignored. For a sum aggregation, this means the computed sum may be invalid.

This completes the test of the ignore missing values enhancement.

Test Counter Basis Date Enhancement

4. **Action:** Change the start date back to T0. Change the aggregation to “Counter” and counter type to “NDMX”:

Aggregator: **Counter** ☒ Ignore Missing Values ☐ Prefix With Zero

Aggregator Parameters

Counter Type: **NDMX** Counter Flag: above Threshold: 0

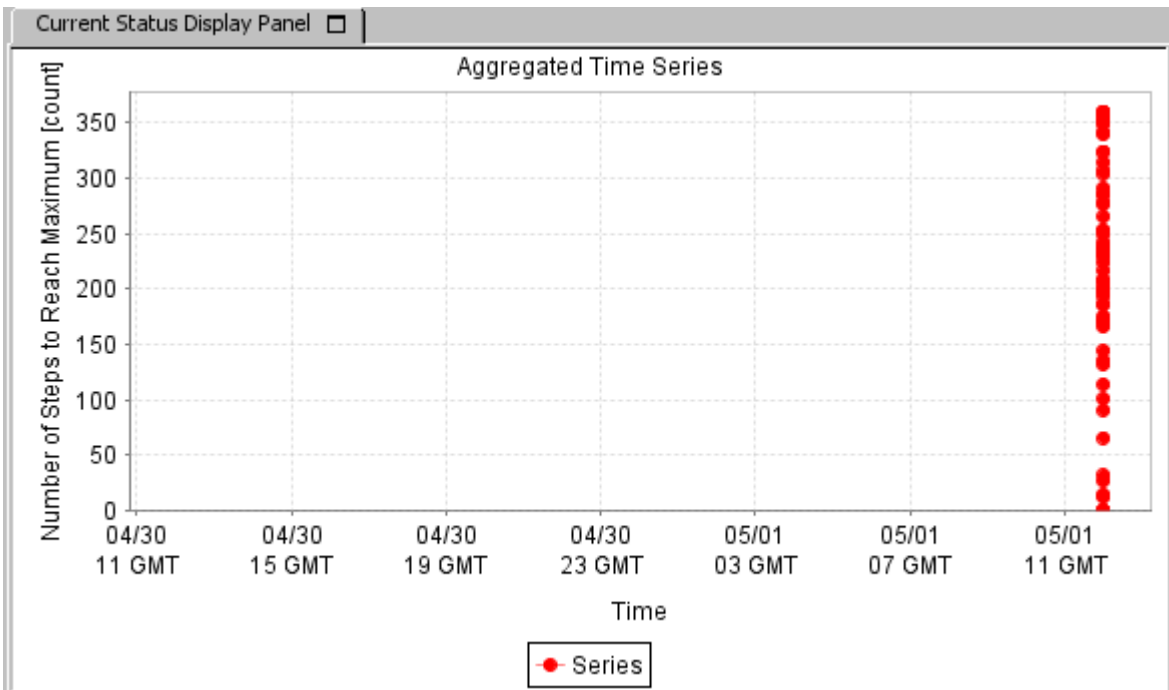
☐ Set Basis Date: T0 Set to Default

Period Parameters

Start Date: **T0** Set to Default

End Date: T0 ± 90 days Set to Relative Date

Results: Counts will now be displayed in the **Current Status Panel**; for example:



- Action:** Set the counter basis date to “T0 – 100 days” (check the **Set Basis Date Checkbox** first):

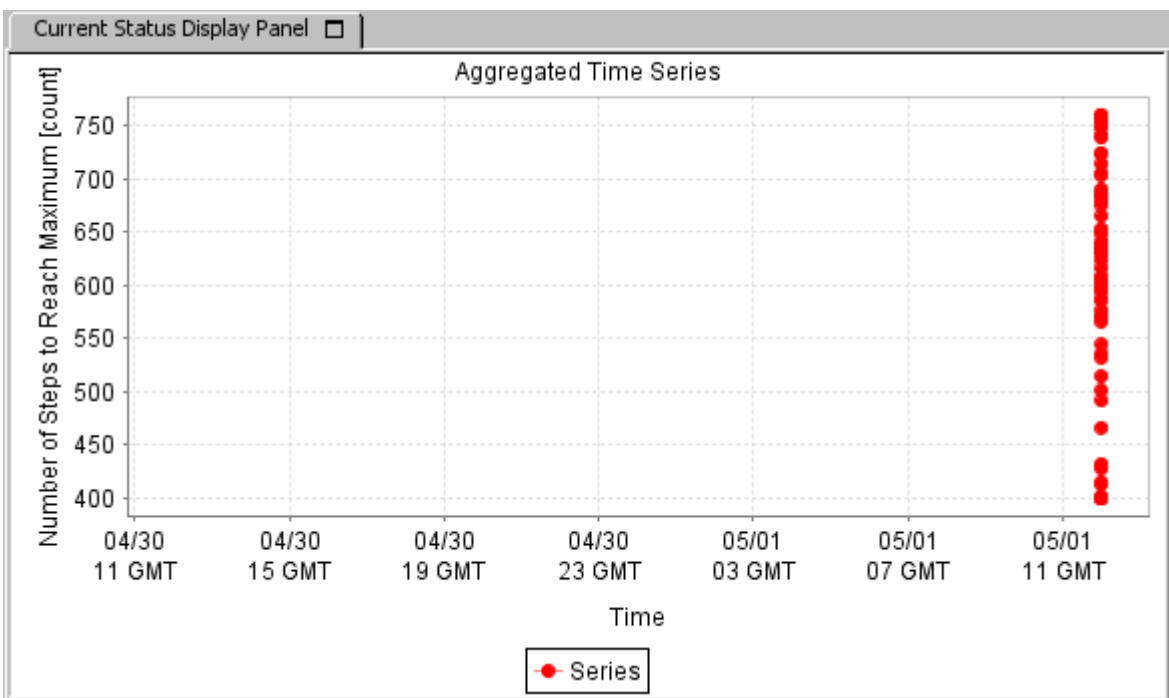
Aggregator: ☒ Ignore Missing Values ☐ Prefix With Zero

Aggregator Parameters

Counter Type: Counter Flag: Threshold:

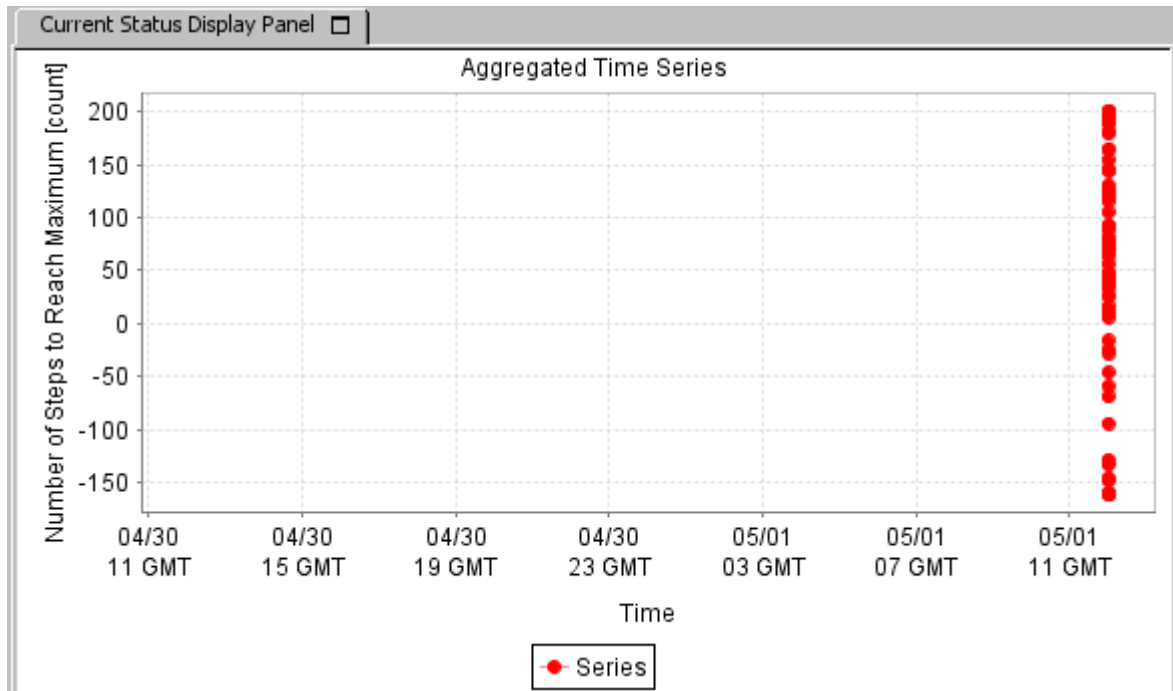
☒ Set Basis Date:

Results: The values displayed in the **Current Status Panel** should increase by exactly 400, since 100 days is 400 6-hour periods. For example:



6. **Action:** Set the counter basis date to T0 + 40 days.

Results: The counts displayed will be decreased by 160 relative to the first plot shown above (Step 4), with some values possibly being negative. For example:



This completes the test of the counter basis date.

Test the Prefix With Zero Enhancement:

7. **Action:** Change the aggregation panel settings to the following:

Aggregator: **Volume** ☒ Ignore Missing Values ☐ Prefix With Zero

Aggregator Parameters

Period Parameters

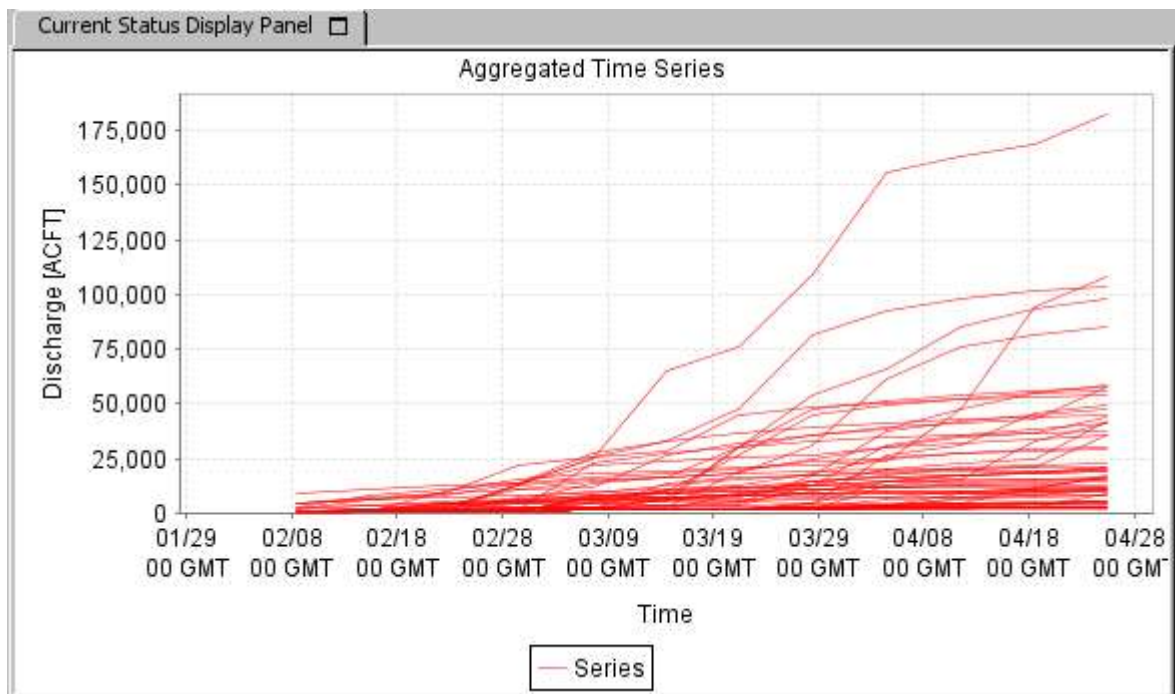
Start Date: T0 Set to Default

End Date: T0 + 90 days Set to Relative Date

Computation Time Step: 1 weeks

Aggregation Period: 1 accumulated ending at computation time

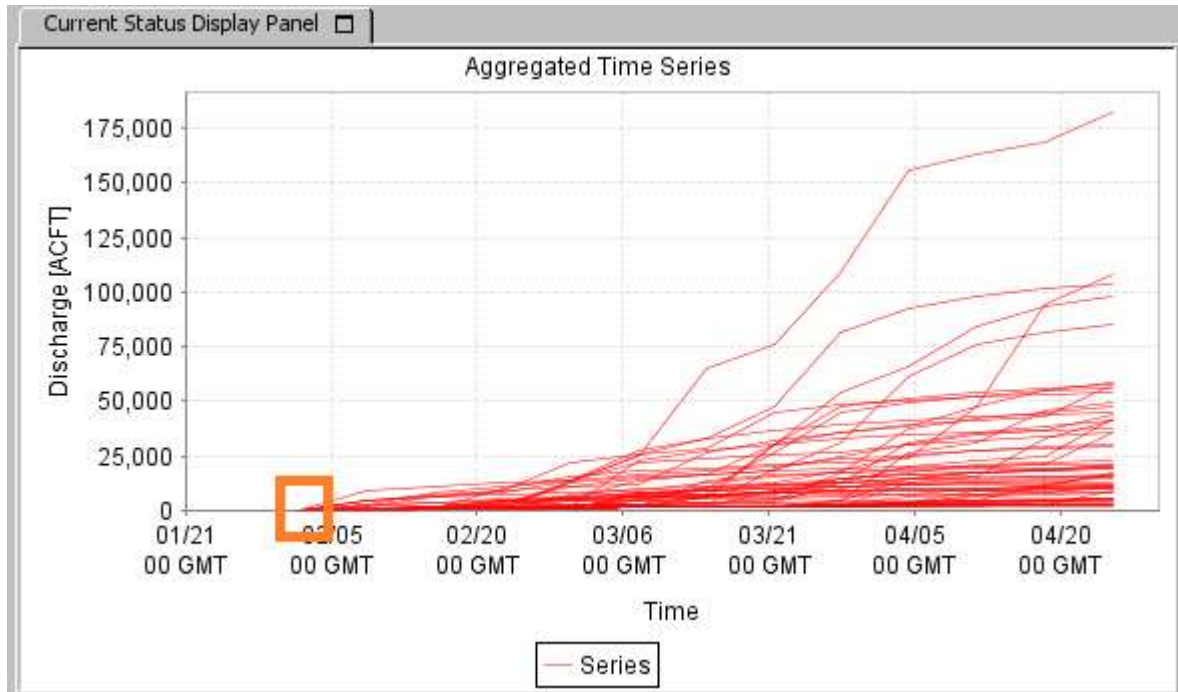
Results: The **Current Status Panel** will display volumes that are accumulated from one week to the next (e.g., the second plotted value is the first value plus the volume accumulated during the second week). For example:



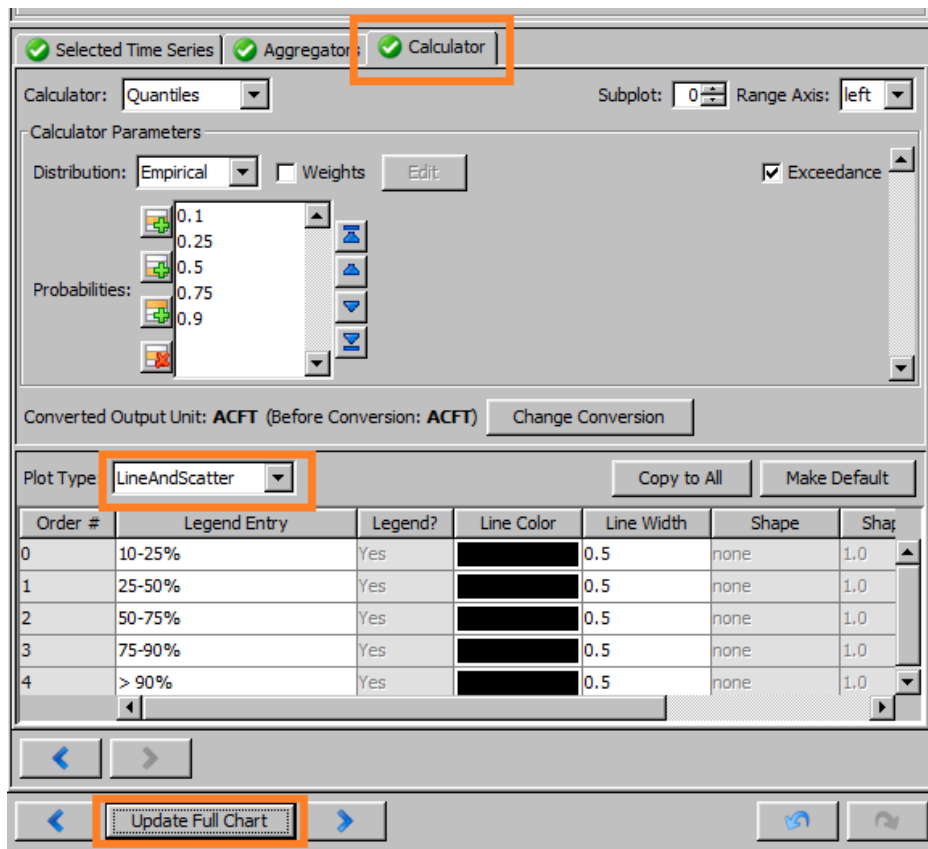
8. **Action:** Check the **Prefix with Zero** Checkbox:



Results: The time series displayed in the **Current Status Panel** will all be prefixed by a zero value one aggregation computation time step before the first value. For example (note the zero values in the orange box):

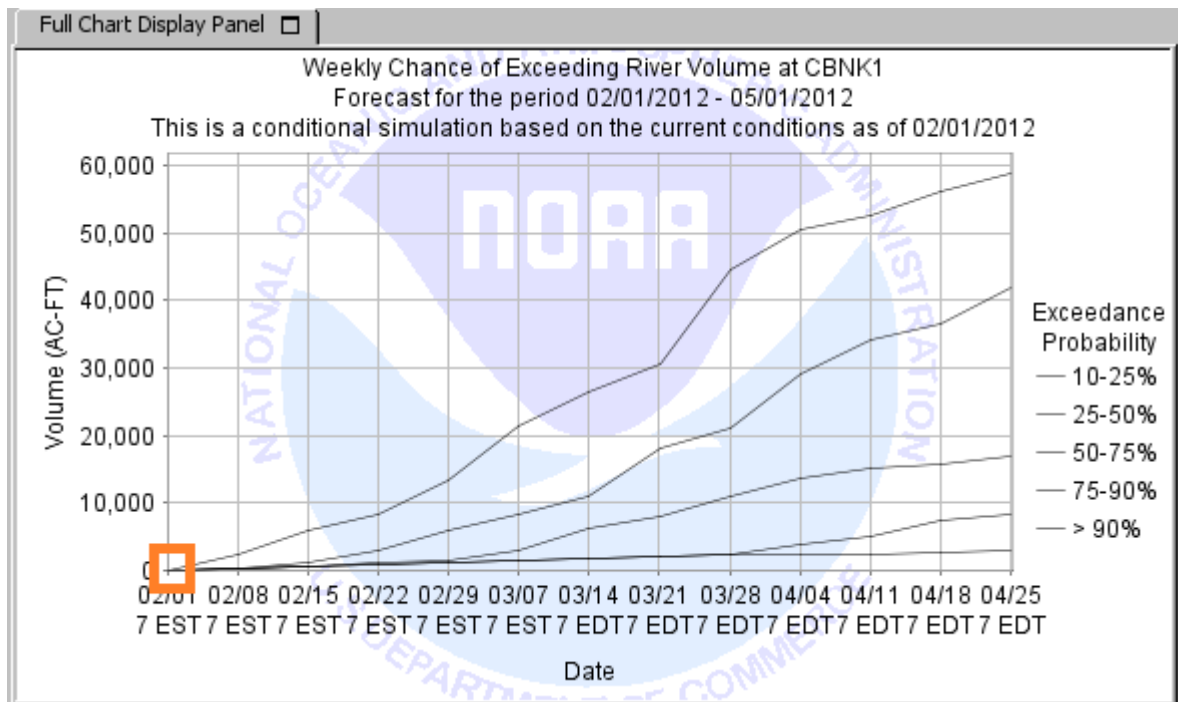


9. **Action:** Switch to the **Calculator Subpanel**. Change the plot type to “LineAndScatter” and click **Update Full Chart**:



(Make sure Line Width is set to the default of 0.5).

Results: The zeros will become part of the calculations. For example, the **Full Chart Display Panel** in the lower right may display the following (again, note the orange box):



This completes this test. Close the **GraphGen Editor Panel** without saving the product and shutdown the SA.